

FINAL

# 2010 URBAN WATER MANAGEMENT PLAN

Adopted : June 23, 2011



APPLE VALLEY RANCHOS **WATER COMPANY**



*Prepared by:*  
**Kennedy/Jenks Consultants**

June 2011



Kennedy/Jenks Consultants

2775 North Ventura Road, Suite 100  
Oxnard, California 93036  
805-973-5700  
FAX: 805-973-1440

FINAL  
2010 Urban Water  
Management Plan

June 2011

Prepared for  
Apple Valley  
Ranchos Water Company  
P.O. Box 7005  
21760 Ottawa Road  
Apple Valley, CA 92307

K/J Project No. 1089028\*00



**RESOLUTION  
OF BOARD OF DIRECTORS OF  
APPLE VALLEY RANCHOS WATER COMPANY  
A CALIFORNIA CORPORATION**

At a regularly scheduled and duly noticed meeting of the Board of Directors of Apple Valley Ranchos Water Company, held on June 23, 2011, and at which a quorum of the Directors were present, the Board passed the following Resolution:

**WHEREAS**, the California Urban Water Management Planning Act, Water Code section 10610 et seq. (the Act) mandates that every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare and adopt an updated Urban Water Management Plan (UWMP) at least once every five years on or before December 31, in years ending five and zero; and

**WHEREAS**, the Water Conservation Act of 2009, Water Code section 10608 et seq. (SBX7-7), extended the time by which urban retail water suppliers must adopt their 2010 UWMPs to July 1, 2011 and, among other things, established requirements for urban retail water suppliers to prepare urban water use targets in accordance with the goals of SBX7-7 to reduce statewide daily per capita water use by 15 percent by the year 2015 and 20 percent by the year 2020; and

**WHEREAS**, Apple Valley Ranchos Water Company is an "urban retail water supplier" for purposes of SBX7-7 because it directly provides potable municipal water to more than 3,000 end users; and

**WHEREAS**, in accordance with applicable law, including the requirements of the Act and SBX7-7, Apple Valley Ranchos Water Company has prepared its 2010 UWMP and has undertaken certain agency coordination, public notice, public involvement and outreach, public comment, and other procedures in relation to its 2010 UWMP; and

**WHEREAS**, in accordance with applicable law, including Water Code sections 10608.26 and 10642, and Government Code section 6066, Apple Valley Ranchos Water Company made its Draft 2010 UWMP available for public inspection, and caused to be published within the jurisdiction of the Apple Valley Ranchos Water Company a notice of public hearing regarding the Apple Valley Ranchos Water Company's 2010 UWMP, with publication dates of May 5, 2011 and June 3, 2011; and

**WHEREAS**, in accordance with applicable law, a public hearing was held on June 20, 2011 at 9:30 am at the office of Apple Valley Ranchos Water Company, located at 21760 Ottawa Road, Apple Valley, California 92307 to, among other things, provide members of the public and other interested entities with the opportunity to be heard in connection with Apple Valley Ranchos Water Company's 2010 UWMP and the proposed adoption thereof; and

**WHEREAS**, the Board of Directors of Apple Valley Ranchos Water Company has reviewed and considered the purposes and requirements of the Urban Water Management Planning Act and SBX7-7, the contents of the 2010 UWMP, the documentation contained in the administrative record in support of the 2010 UWMP, and all public and agency input received



with regard to the 2010 UWMP, and has determined that the factual analyses and conclusions set forth in the 2010 UWMP are supported by substantial evidence; and

**WHEREAS**, the 2010 Plan is a general information document and complements other regional water planning documents, including the Mojave Water Agency's California's 2010 Regional Urban Water Management Plan; and

**WHEREAS**, the 2010 Plan provides a local perspective and analysis of the current and future water demands and supplies within the service area of Apple Valley Ranchos Water Company; and

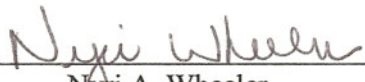
**WHEREAS**, the 2010 Plan describes water quality impacts on water supply reliability, water demand management measures, and water shortage contingency planning for Apple Valley Ranchos Water Company's; and

**WHEREAS**, the 2010 Plan describes Apple Valley Ranchos Water Company's SBX7-7 baselines, targets, implementation plan and economic impacts of achieving the targets; and

**WHEREAS**, the Board of Directors has reviewed the 2010 Plan and acknowledges the essential nature of a long-term, reliable water supply within its boundaries as described therein.

**NOW THEREFORE, BE IT HEREBY RESOLVED that the Board of Directors of the Apple Valley Ranchos Water Company:**

1. Adopts Method 1 under Water Code section 10608.20(b) for determining its urban water use targets; and
2. Adopts the 2010 Urban Water Management Plan; and
3. Authorizes and directs the General Manager to implement the components of the 2010 Urban Water Management Plan in accordance with the Urban Water Management Planning Act and SBX7-7, including, but not limited to, Apple Valley Ranchos Water Company's Water Conservation Programs and its Water Shortage Contingency Plan.

  
\_\_\_\_\_  
Nyri A. Wheeler  
Corporate Secretary

## Table of Contents

---

<i>List of Tables</i> .....	<i>iii</i>
<i>List of Figures</i> .....	<i>iv</i>
<i>List of Appendices</i> .....	<i>v</i>
Section 1: Introduction .....	1-1
1.1 Overview .....	1-1
1.2 Purpose .....	1-1
1.3 Implementation of the Plan.....	1-3
1.3.1 Joint Preparation of the Plan.....	1-3
1.3.2 Plan Adoption.....	1-3
1.3.3 Public Outreach.....	1-4
1.3.4 Resources Maximization .....	1-4
1.4 Apple Valley Ranchos Water Company Background .....	1-5
1.5 Climate .....	1-6
1.6 Potential Effects of Global Warming.....	1-9
1.7 Other Demographic Factors .....	1-9
1.8 List of Abbreviations and Acronyms.....	1-10
Section 2: Water Use .....	2-1
2.1 Overview .....	2-1
2.2 Population .....	2-1
2.3 Historic Water Use .....	2-3
2.4 Existing and Targeted Per Capita Water Use in AVRWC Service Area.....	2-4
2.4.1 Base Daily Per Capita Water Use for SBX7-7 Reduction .....	2-4
2.4.2 Urban Water Use Targets for SBX7-7 Reduction .....	2-5
2.5 Projected Water Use .....	2-6
2.5.1 Water Use Data Collection.....	2-6
2.5.2 Demand Forecast Methodology .....	2-6
2.5.3 Water Supply.....	2-8
2.5.3.1 Low Income Projected Water Demands .....	2-9
2.6 Other Factors Affecting Water Usage .....	2-9
2.6.1 Weather Effects on Water Usage.....	2-9
2.6.2 Conservation Effects on Water Usage .....	2-10
Section 3: Water Resources .....	3-1
3.1 Overview .....	3-1
3.2 Local Water Supplies .....	3-1
3.2.1 Groundwater .....	3-2
3.2.1.1 Mojave River Groundwater Basin .....	3-5
3.2.1.2 Groundwater Basin Description .....	3-5

## Table of Contents (cont'd)

	3.2.2 Potential Supply Inconsistency .....	3-10
3.3	Transfers, Exchanges, and Groundwater Banking Programs.....	3-10
	3.3.1 Transfers and Exchanges .....	3-10
	3.3.2 Opportunities for Short and Long-Term Transfers and Exchanges .....	3-11
	3.3.3 Groundwater Banking Programs.....	3-11
3.4	Development Of Desalination .....	3-12
	3.4.1 Opportunities for Brackish Water and/or Groundwater Desalination .....	3-12
	3.4.2 Opportunities for Seawater Desalination .....	3-12
3.5	Recycled Water Plan .....	3-12
	3.5.1 Town of Apple Valley .....	3-13
	3.5.2 Planned VVWRA Improvements and Expansions .....	3-14
	3.5.3 Potential and Projected Use .....	3-15
	3.5.4 Optimization and Incentives for Recycled Water Use.....	3-15
Section 4:	Water Quality.....	4-1
4.1	Overview .....	4-1
4.2	Imported Water Quality .....	4-1
4.3	Groundwater Quality .....	4-2
4.4	Groundwater Protection .....	4-2
	4.4.1 Water Quality Monitoring .....	4-2
	4.4.2 Wellhead Protection.....	4-2
	4.4.3 Identification and Destruction of Abandoned Wells .....	4-3
	4.4.4 Hazardous Materials Response.....	4-3
4.5	Water Quality Impacts on Reliability .....	4-3
Section 5:	Reliability Planning .....	5-1
5.1	Overview .....	5-1
5.2	Reliability of Water Supplies .....	5-1
5.3	Average, Single-Dry, and Multiple-Dry Year Planning .....	5-2
	5.3.1 Local Supplies .....	5-2
5.4	Supply and Demand Comparisons .....	5-2
	5.4.1 Average/Normal Water Year.....	5-2
	5.4.2 Single-Dry Year .....	5-3
	5.4.3 Multiple-Dry Year .....	5-3
	5.4.4 Summary of Comparisons .....	5-3
Section 6:	Demand Management Measures.....	6-1
6.1	Background.....	6-1
6.2	AVRWC and the Demand Management Measures .....	6-1
	6.2.1 Foundational BMPs .....	6-2
	6.2.1.1 Utility Operations .....	6-2
	6.2.1.2 Education.....	6-6



## Table of Contents (cont'd)

6.2.2	Programmatic BMPs .....	6-7
6.2.3	Selected Programs.....	6-9
6.2.3.1	Economic Impacts / Costs .....	6-10
6.2.3.2	Implementation Schedule .....	6-10
6.2.3.3	Evaluating Effectiveness of the DMMs .....	6-11
6.2.3.4	Impacts of Conservation .....	6-11
Section 7:	Water Storage Contingency Planning .....	7-1
7.1	Overview .....	7-1
7.2	Coordinated Planning.....	7-1
7.3	Stages of Action to Respond to Water Shortages.....	7-1
7.4	Minimum Water Supply Available During Next Three Years.....	7-3
7.5	Actions to Prepare for Catastrophic Interruption .....	7-3
7.5.1	General .....	7-3
7.5.2	Regional Power Outage Scenarios .....	7-4
7.6	Mandatory Prohibitions During Shortages.....	7-4
7.7	Consumptive Reduction Methods During Restrictions .....	7-5
7.7.1	Supply Shortage Triggering Levels .....	7-5
7.7.2	Consumption Limits.....	7-5
7.7.3	New Demand .....	7-6
7.8	Penalties for Excessive Use.....	7-6
7.8.1	Appeal Procedure .....	7-6
7.9	Revenue and Expenditure Impacts and Measures to Overcome Those Impacts.....	7-6
7.10	Water Shortage Contingency Ordinance.....	7-6
7.11	Mechanism to Determine Reductions in Water Use.....	7-7
References.....		i

## List of Tables

1-1	Agency Coordination Summary
1-2	Public Participation Timeline
1-3	Climate Data for the Apple Valley Ranchos Water Company
2-1	AVRWC Current Population Estimates
2-2	AVRWC Projected Population Estimates
2-3	Annual Production for AVRWC (AF)
2-4	Base Daily Per Capita Water Use
2-5	Components of Target Daily Per Capita Water Use

## Table of Contents (cont'd)

---

2-6	Projected Water Demands
2-7	Current and Projected Water Deliveries (By Customer Type) (AF)
3-1	Summary of Current and Planned Water Supplies (AFY)
3-2	DWR Groundwater Basins
3-3	Groundwater Pumping Rights
3-4	Historical AVRWC Groundwater Production (AFY)
3-5	AVRWC Projected Groundwater Production (AFY)
3-6	AVRWC Groundwater Basin Supply Reliability
3-7	Town of Apple Valley Projected Average Wastewater Flow
4-1	Current and Projected Water Supply Changes Due To Water Quality Percentage Change
5-1	Basis of Water Year Data
5-2	Projected Average/Normal Year Supplies and Demand (AFY)
5-3	Projected Single-Dry Year Supplies and Demand (AFY)
5-4	Projected Multiple-Dry Year Supplies and Demand (AFY)
6-1	Tiered Water Rates
6-2	2006-2010 Water Revenue
6-3	Projected Budget for Public Information and Education Programs
6-4	Education and Outreach Programs
6-5	DMM GPCD Target Calculation
6-6	Annual DMM Compliance Targets (in GPCD)
6-7	Impact of WUE Activities
6-8	Lifetime Water Savings by WUE Active Programs
6-9	Projected Number of Activities Implemented per Year
7-1	Water Supply Shortage Stages and Reduction Goals
7-2	Estimate of Minimum Supply for the Next Three Years
7-3	Water Reduction Triggering Levels

## List of Figures

---

1-1	AVRWC Service Area
1-2	MWA Adjudicated Boundary and Subareas

## Table of Contents (cont'd)

---

- 2-1 Historical Annual Production
- 2-2 Historical AVRWC Single-Family GPCD
- 3-1 DWR Groundwater Basins within MWA
- 3-2 Mojave Basin Area Boundaries
- 3-3 Hydrogeologic Setting
- 6-1 Water Balance

## List of Appendices

---

- A UWMP Checklist
- B Public Outreach Materials
- C Judgment After Trial January 10, 1996, Mojave Basin Area Adjudication Text (*included on CD-ROM*)
- D MWA 2004 Groundwater Management Plan (*included on CD-ROM*)
- E Town of Apple Valley Water Conservation Ordinance
- F Rule No. 14.1 Water Conservation and Rationing Plan



## Section 1: Introduction

---

### 1.1 Overview

This volume presents the Urban Water Management Plan 2010 (Plan) for the Apple Valley Ranchos Water Company (AVRWC, Company) service area. This chapter describes the general purpose of the Plan, discusses Plan implementation, and provides general information about AVRWC, and service area characteristics. A list of acronyms and abbreviations is also provided.

### 1.2 Purpose

An Urban Water Management Plan (UWMP) is a planning tool that generally guides the actions of water management agencies. It provides managers and the public with a broad perspective on a number of water supply issues. It is not a substitute for project-specific planning documents, nor was it intended to be when mandated by the State Legislature. For example, the Legislature mandated that a plan include a section which “describes the opportunities for exchanges or water transfers on a short-term or long-term basis.” (California Urban Water Management Planning Act, Article 2, Section 10630(d).) The identification of such opportunities, and the inclusion of those opportunities in a general water service reliability analysis, neither commits a water management agency to pursue a particular water exchange/transfer opportunity, nor precludes a water management agency from exploring exchange/transfer opportunities not identified in the plan. When specific projects are chosen to be implemented, detailed project plans are developed, environmental analysis, if required, is prepared, and financial and operational plans are detailed.

In short, this Plan is a management tool, providing a framework for action, but not functioning as a detailed project development or action. It is important that this Plan be viewed as a long-term, general planning document, rather than as an exact blueprint for supply and demand management. Water management in California is not a matter of certainty, and planning projections may change in response to a number of factors. From this perspective, it is appropriate to look at the Plan as a general planning framework, not a specific action plan. It is an effort to generally answer a series of planning questions including:

- What are the potential sources of supply and what is the reasonable probable yield from them?
- What is the probable demand, given a reasonable set of assumptions about growth and implementation of good water management practices?
- How well do supply and demand figures match up, assuming that the various probable supplies will be pursued by the implementing agency?

Using these “framework” questions and resulting answers, the implementing agency will pursue feasible and cost-effective options and opportunities to meet demands. AVRWC will explore enhancing basic supplies from traditional sources such as imported water from the Mojave Water Agency (MWA) as well as other options. These include groundwater extraction, water exchanges, recycling, desalination, and water banking/conjunctive use. Specific planning

efforts will be undertaken in regard to each option, involving detailed evaluations of how each option would fit into the overall supply/demand framework, how each option would impact the environment, and how each option would affect customers. The objective of these more detailed evaluations would be to find the optimum mix of conservation and supply programs that ensure that the needs of the customers are met.

The California Urban Water Management Planning Act (Act) requires preparation of a plan that:

- Accomplishes water supply planning over a 20-year period in five year increments. (AVRWC is going beyond the requirements of the Act by developing a plan which spans 25 years.)
- Identifies and quantifies adequate water supplies, including recycled water, for existing and future demands, in normal, single-dry, and multiple-dry years.
- Implements conservation and efficient use of urban water supplies.

A checklist to ensure compliance of this Plan with the Act requirements is provided in Appendix A.

In short, the Plan answers the question: *Will there be enough water for the Apple Valley community in future years, and what mix of programs should be explored for making this water available?*

It is the stated goal of AVRWC to provide a high standard of water quality and customer service at a responsible cost, to protect the water resources of the AVRWC, and to promote cooperation and respect among customers, employees, neighboring communities and public-private agencies. Based on conservative water supply and demand assumptions over the next 25 years in combination with conservation of non-essential demand during certain dry years, the Plan successfully achieves this goal.

Additionally, newly passed State legislation, Senate Bill 7 of Special Extended Session 7 (SBX7-7) was signed into law in November 2009, which calls for progress towards a 20 percent reduction in per capita water use statewide by 2020. As a result, the legislation now mandates each urban retail supplier to develop and report a water use target in the retailer's 2010 UWMP. The legislation further requires that retailers report an interim 2015 water use target, their baseline daily per capita use and 2020 compliance daily per capita use, along with the basis for determining those estimates.

SBX7-7 provides four possible methods for an urban retail water supplier to use to calculate its water use target. The California Department of Water Resources (DWR) has also developed methodologies for calculating base daily per capita water use, baseline commercial, industrial and institutional water use, compliance daily per capita water use, gross water use, service area population, indoor residential water use and landscape area water use.

Also of importance is Assembly Bill (AB) 1420. AB 1420, passed in 2007 and in effect as of January 2009, changes the funding eligibility requirements of Section 10631.5 of the Water Code. For any urban water supplier to be eligible for grant or loan funding administered by DWR, the State Water Resources Control Board (SWRCB) or the Bay-Delta Authority (such as those funding programs Propositions 50 and 84), the supplier must show implementation of water use efficiency demand management measures/best management practices



(DMMS/BMPs) listed and described in the Act and the California Urban Water Conservation Council (CUWCC) Memorandum of Understanding Regarding Urban Water Conservation in California (MOU), or show the schedules and budgets by which the supplier will begin implementing the DMMs/BMPs. Any supplier not implementing the measures based on cost-effectiveness must submit proof showing why the measures are not cost-effective.

### 1.3 Implementation of the Plan

Water Code Section 10617 defines an urban water supplier as any supplier that provides water to more than 3,000 service connections or supplies more than 3,000 acre-feet (AF) of water annually. Currently AVRWC delivers water to over 19,000 connections, therefore requiring the Company to prepare and adopt an UWMP. This Plan has been prepared for the AVRWC.

#### 1.3.1 Joint Preparation of the Plan

AVRWC cooperates with the MWA managing the region's water resources. The AVRWC consulted MWA's draft 2010 UWMP while preparing this UWMP. MWA was also notified that the AVRWC is updating its UWMP and input was solicited. AVRWC coordinated the preparation of the Plan with the local community. The Town of Apple Valley and neighboring cities including Victorville, and the County of San Bernardino were notified of the opportunity to provide input regarding the Plan. Water resource specialists with expertise in water resource management were retained to assist the AVRWC in preparing the details of the Plan. Agency coordination for this Plan is summarized in Table 1-1.

**TABLE 1-1  
AGENCY COORDINATION SUMMARY**

	<b>Participated in UWMP Develop- ment</b>	<b>Received Copy of Draft</b>	<b>Comment on Draft</b>	<b>Attended Public Meetings</b>	<b>Contacted for Assist- ance</b>	<b>Sent Notice of Intent to Adopt</b>
Mojave Water Agency	✓	✓		✓	✓	✓
City of Victorville				✓	✓	✓
Town of Apple Valley				✓		✓
San Bernardino County Planning Department						✓

#### 1.3.2 Plan Adoption

AVRWC began preparation of this Plan for the AVRWC service area in early 2010. The final draft of the Plan was adopted by the Agency Board on June 23, 2011 and submitted to DWR within 30 days of Board approval. This plan includes all information necessary to meet the requirements of Water Conservation Act of 2009 (Wat. Code, §§ 10608.12-10608.64) and the Urban Water Management Planning Act (Wat. Code, §§ 10610-10656).

### 1.3.3 Public Outreach

AVRWC has encouraged community participation in water planning. For the current Plan, a public session was held for review and to solicit input on the Draft Plan before its adoption. Interested groups were informed about the development of the Plan along with the schedule of public activities. Notices of public meetings were published in the local press. Copies of the Draft Plan were made available on the AVRWC's website and at its Headquarters.

AVRWC has and continues to actively encourage community participation in its on-going water management activities and specific water related projects. The AVRWC's public participation programs include mailings, public meetings, and web-based communication. The AVRWC's water conservation program involves a variety of public awareness programs. AVRWC has regularly scheduled Board of Directors meetings. Table 1-2 presents a timeline for public participation during the development of the Plan. A copy of the public outreach materials, including paid advertisements, newsletter covers, website postings, and invitation letters are attached in Appendix B.

**TABLE 1-2  
PUBLIC PARTICIPATION TIMELINE**

<b>Date</b>	<b>Event</b>	<b>Description</b>
May 4, 2011	Preliminary Draft UWMP	Must notify Planning Groups 60 days before first Public Hearing
June 15, 2011	Final Draft Workshop	Workshop for Staff at AVRWC
June 20, 2011	AVRWC Public Hearing	Review contents of Draft UWMP and take comments
June 23, 2011	AVRWC Board of Directors meeting	UWMP considered for approval by the AVRWC Board

The components of public participation include:

#### **Local Media**

- Paid advertisements in local newspapers

#### **City/County Outreach**

- Meeting with MWA Planning Division
- Meeting with County of San Bernardino by phone and mail.

#### **Public Availability of Documents**

- AVRWC website
- AVRWC Headquarters

### 1.3.4 Resources Maximization

Several documents were developed to enable AVRWC to maximize the use of available resources, including the following:

- *AVRWC Technical Report Analysis of Source and Storage Capacity 2009 Update*,
- *Mojave Water Agency 2004 Integrated Regional Water Management Plan* (Regional Plan).
- *Mojave Water Agency 2010 Urban Water Management Plan* (MWA 2010 UWMP).

Chapter 3 of this Plan describes in detail the water supply available to AVRWC for the 25-year period covered in this Plan. Additional discussion regarding documents developed to maximize resources is included in Section 3.2 and Chapter 5.

#### 1.4 Apple Valley Ranchos Water Company Background

AVRWC is an investor-owned utility created in 1947 by Apple Valley Ranchos Development Company. In 1987 the company was purchased by Park Water Company (PWC). Park Water Company is currently the parent company of AVRWC.

The current AVRWC service area covers approximately 50 square miles encompassing the majority of the Town of Apple Valley and portions of the surrounding area (Figure 1-1). Approximately 81 percent of the town's population is served by AVRWC; the remainder is served by other public and private water providers.

The Town of Apple Valley is located in the High Desert region of San Bernardino County (County) and is bordered by Victorville and Hesperia on the west. San Bernardino County has experienced continuous population growth, especially since 1970, with a five to six percent growth rate between 1970 and 2000. In the past, the High Desert and West Valley regions of the County have experienced the highest growth rates. However, recently, growth levels have declined.

AVRWC provides domestic water from 23 wells within its service area. The total capacity of these wells is approximately 37 million gallons per day (mgd). All wells are located in the Mojave Groundwater Basin (Basin). The Basin, which is adjudicated, is a source of groundwater flowing north from the San Bernardino Mountains. Water is recharged to the Basin through percolation and sub-surface flow from adjoining basins. This groundwater is the only source of supply for the AVRWC system. The service area for AVRWC is shown on Figure 1-1.

AVRWC is one of ten water purveyors within MWA's service area that is required to complete an UWMP. MWA is a State Water Project (SWP) contractor that serves an area of 4,900 square miles of the high desert area. The MWA Board sits as the Watermaster for the adjudication of the Mojave Groundwater Basin.

For management purposes under the Mojave Basin Area Judgment (Judgment), MWA split the Mojave River watershed and associated groundwater basins into five separate "subareas." There are five subarea locations; 1) Oeste, 2) Este, 3) Alto, 4) Centro and 5) Baja, with AVRWC being located in the Alto subarea as shown on Figure 1-2. Also for the purposes of implementing the Judgment, the northern part of the Alto Subarea was defined as a sub-management unit – the Alto Transition Zone; this zone was created to acknowledge local geology and to better address the water flow from Alto to Centro.

The Judgment assigned Base Annual Production (BAP) quotas to each producer using 10 acre-feet per year (AFY) or more, based on historical production. Users are assigned a variable Free Production Allowance (FPA), which is a uniform percentage of BAP set for each subarea. This percentage is reduced or “ramped-down” over time until total FPA comes into balance with available supplies. The current FPA for the Alto Subarea is 80 percent of BAP for agriculture and 60 percent of BAP for municipal and industrial.

If AVRWC pumps more than its FPA, then it must purchase SWP replenishment water from MWA equal to the amount of production in excess of the FPA. Alternatively, the Company may meet its obligation by transferring unused FPA from another party within the subarea.

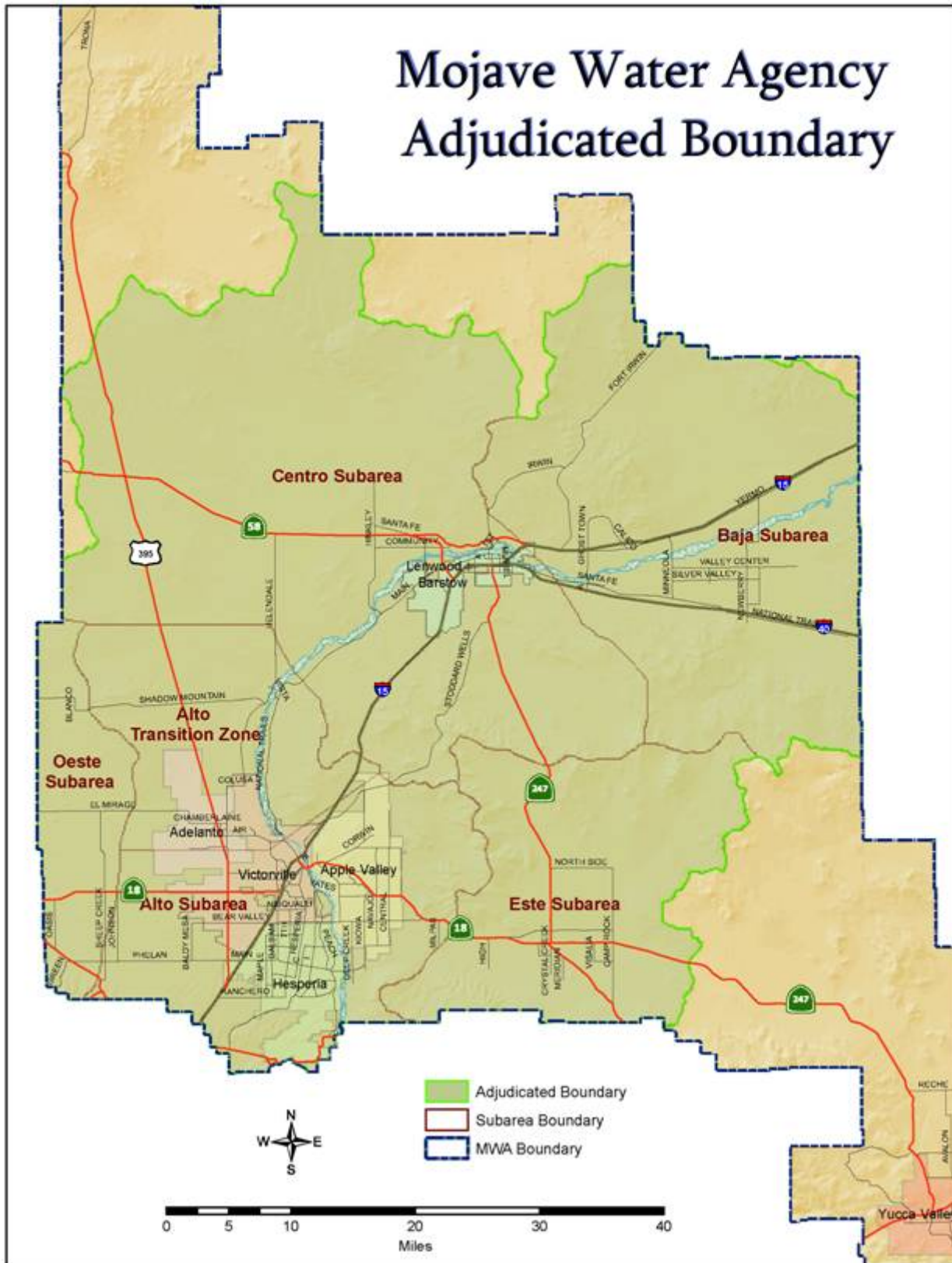
## 1.5 Climate

The Mojave Water Agency maintains a regional network of weather monitoring stations throughout the watershed, which some are funded by MWA and others are provided courtesy of various local and federal government agencies, and citizen observers program. The stations collect various weather data on temperature, precipitation, and evaporation. Rain gages are mostly located within the Mojave Basin Area and the surrounding mountains.

For AVRWC, representative precipitation, temperature, and reference evapotranspiration (ET<sub>o</sub>) data are reported in Table 1-3 for the period 1997 through 2009. Average annual precipitation during the same period was approximately seven (7) inches.



**FIGURE 1-2  
MWA ADJUDICATED BOUNDARY AND SUBAREAS**





**TABLE 1-3  
CLIMATE DATA FOR THE APPLE VALLEY RANCHOS WATER COMPANY**

Station	Victorville		
	Total ETo (in)	Total Precip (in)	Avg Air Tmp (F)
1997	68.4	6.4	61.4
1998	62.0	11.4	58.3
1999	67.8	3.2	60.0
2000	68.4	3.4	61.2
2001	67.3	6.9	61.5
2002	69.6	2.4	61.0
2003	66.6	12.4	61.5
2004	66.2	13.6	60.6
2005	64.6	13.2	60.6
2006	68.1	4.1	60.8
2007	71.2	3.3	61.5
2008	68.7	3.7	61.3
2009	66.1	3.0	58.9
<b>Avg</b>	<b>67.3</b>	<b>6.7</b>	<b>60.7</b>

Sources:

<http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?cavict+sca>

<http://www.cimis.water.ca.gov/cimis/frontMonthlyEToReport.do>

## 1.6 Potential Effects of Global Warming

A topic of growing concern for water planners and managers is global warming and the potential impacts it could have on California's future water supplies. DWR's California Water Plan Update 2009 considers how climate change may affect water availability, water use, water quality, and the ecosystem.<sup>1</sup>

Volume 1, Chapter 5 of the California Water Plan, "Managing an Uncertain Future," evaluated three different scenarios of future water demand based on alternative but plausible assumptions on population growth, land use changes, water conservation and also future climate change might have on future water demands. Future updates will test different response packages, or combinations of resource management strategies, for each future scenario. These response packages help decision-makers, water managers, and planners develop integrated water management plans that provide for resources sustainability and investments in actions with more sustainable outcomes.

## 1.7 Other Demographic Factors

Water service is provided to residential, commercial, and some industrial customers and for other uses, such as fire protection.

Over the past decade the Apple Valley area (along with most of California) experienced significant increases in both single family and multi-family residential construction, as well as in commercial construction. As the local population has increased, the demand for water has also

<sup>1</sup> Final California Water Plan Update 2009 Integrated Water Management: Bulletin 160.

increased. However, the recent economic downturn, coupled with a three-year dry period during 2007-2010, has reduced demand on what is likely an interim basis.

## 1.8 List of Abbreviations and Acronyms

The following abbreviations and acronyms are used in this report.

AB	Assembly Bill
ACOE	U.S. Army Corps of Engineers
Act	California Urban Water Management Planning Act
ADD	average day demand
af	acre-feet
afy	acre-feet per year
AVRWC	Apple Valley Ranchos Water Company
AWAC	Alliance for Water Awareness and Conservation
AWWA	American Water Works Association
AWWARF	American Water Works Association Research Foundation
BAP	Base Annual Production
Basin	Mojave River Groundwater Basin
BMPs	Best Management Practices
CCF	One Hundred Cubic Feet
CCR	Consumer Confidence Report
CDPH	California Department of Public Health
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CIP	capital improvement project
CII	Commercial/Institutional/Industrial
Company	Apple Valley Ranchos Water Company
County	San Bernardino County
CSA	County Service Area
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
DBP	Disinfection by-products
Delta	Sacramento-San Joaquin Delta
DFG	California Department of Fish and Game
HWD	Hesperia Water District
DMM	Demand Management Measures
DOF	California Department of Finance
DTSC	Department of Toxic Substances Control
DWR	California Department of Water Resources
DWSAP	Drinking Water Source Assessment Program
EC	Electrical conductivity
Edison	Southern California Edison

EIR	Environmental Impact Report
EPA	Environmental Protection Agency
ETo	Evapotranspiration
FPA	Free Production Allowance
gpcd	gallons per capita per day
gpd	gallons per day
gpm	gallons per minute
GWMP	Groundwater Management Plan
HECW	high efficiency clothes washers
HET	high efficiency toilet
Judgment	Mojave Basin Area Judgment
kW	kilowatt
LRWQCB	Lahontan Regional Water Quality Control Board
M&I	Municipal and Industrial
MAF	million acre-feet
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MDD	maximum day demand
MEEC	Mojave Environmental Education Consortium
MFR	Multi-Family Residential
mg	million gallons
mgd	million gallons per day
mg/L	milligrams per liter
MOU	Memorandum of Understanding
MWA	Mojave Water Agency
NPDES	National Pollutant Discharge Elimination System
PCAs	possible contaminating activities
Plan	Urban Water Management Plan 2010
PHG	Public Health Goal
PUC	California Public Utilities Commission
PWSS	Public Water System Statistics
PSY	Production Safe Yield
RAP	Remedial Action Plan
RO	Reverse Osmosis
RWMP	2004 Regional Water Management Plan
RWQCB	Regional Water Quality Control Board
RWWTP	Regional Wastewater Treatment Plant
SB	Senate Bill
SBX7-7	Senate Bill 7 of Special Extended Session 7
SCAG	Southern California Association of Governments
SFR	Single Family Residential
SWP	State Water Project
TDS	Total Dissolved Solids

TOC	Total Organic Carbon
Town	Town of Apple Valley
umhos/cm	Micromhos per centimeter
ULFT	ultra low flush toilet
USGS	US Geological Survey
UWMP	Urban Water Management Plan
VVWRA	Victor Valley Wastewater Reclamation Authority
VWD	Victorville Water District
WMP	Water Master Plan
WRF	Water Reclamation Facility
WRP	Wastewater Reclamation Plant
WSS	Water Sense Specification
WWMP	Wastewater Master Plan

## Section 2: Water Use

---

### 2.1 Overview

This chapter describes historic and current water usage and the methodology used to project future demands within Apple Valley Ranchos Water Company (AVRWC, Company) service area. Water usage is divided into sectors such as residential, commercial and industrial, landscape, and other purposes. To undertake this evaluation, existing land use data and new housing construction information were compiled from AVRWC. This information was then compared to historical trends for new water service connections and customer water usage information. In addition, weather and water conservation effects on historical water usage were factored into the evaluation.

### 2.2 Population

Water use and population data were gathered from available sources. Population is generally calculated as (connections) x (household size), with an adjustment to account for multi-family population. To get household size data, the source was either the U.S. Census or the Environmental Systems Research Institute (ESRI) geographic information system (GIS), depending upon what was available.

Population data was obtained using a two step method that complies with the Senate Bill 7 of Special Extended Session 7 (SBX7-7) requirements. First the household size was determined for a service connection within the AVRWC's service area and then the number of service connections was multiplied by the household size to obtain the population for the AVRWC. The 2000 U.S. Census was used to obtain the number of persons per household for the Town of Apple Valley in the Year 2000. Also, to get household size numbers for 2008 (or a second data point); data from ESRI was used by Census Tract Block Group. ESRI uses a similar method to the U.S. Census American Community Survey (ACS) and the California Department of Finance for estimating population changes in given geographies. The number of service connections was obtained from Department of Water Resources (DWR) annual Public Water System Statistics (PWSS), if available. Where DWR data were not available, connection data were gathered from the Alliance for Water Awareness and Conservation (AWAC) survey data completed by AVRWC.

Table 2-1 presents the estimated population from 2000-2009 for AVRWC.

**TABLE 2-1  
AVRWC CURRENT POPULATION ESTIMATES**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Estimated Household Size <sup>(a)</sup>	2.90	2.93	2.96	3.00	3.03	3.06	3.09	3.02	3.02	3.02
SFR Service Connections <sup>(b)</sup>	13,185	13,514	14,062	14,842	15,527	16,510	17,202	17,332	17,208	17,291
Estimated Population <sup>(c)</sup>	46,081	47,549	49,686	52,553	55,182	58,766	61,513	60,512	60,137	60,388

**Notes:**

- (a) 2000 Household size numbers are taken from 2000 U.S. Census data for the Town of Apple Valley. 2006 and 2007 household size numbers taken from the U.S. Census American Community Survey (ACS).
- (b) DWR Public Water System Survey (PWSS) Data.
- (c) Population is calculated as household size x Single Family Residential (SFR) service connections. Adjustment: add 3,093 MFR units (excluding mobile homes and 1- and 2-unit buildings) - 153 in Golden State = 2940 x 92.0% occupancy = 2705.

As stated in AVRWC's 2009 Update of the Technical Report Analysis of Source and Storage Capacity (2009 Technical Report), source capacity must be well above the projected demand figures in order to be adequate during a hot weather, high demand year. Because AVRWC has a standalone water system with well water as its sole source, estimates for projected demands must be conservative and take into account the deviations.

For planning purposes, the most significant item that is affecting customer demand is the growth rate. In past years an estimated growth rate of 2 percent seemed adequate, but a growth rate of over 5 percent during the years 2003 through 2005 has made it necessary to closely track the growth and carefully plan to meet future demands. With the massive downturn of the region's economy during the latter half of 2007 and continuing through 2008, it has been imperative to more selectively project future customer growth and demands.

Based on the AVRWC's assumptions, it is projected that AVRWC's service area will grow at a more aggressive rate of just over 2 percent (to be conservative and ensure adequate supply is available) per year from 2010 through 2035. Table 2-2 presents projected population estimates calculated using information from Table 2-1 and the Mojave Water Agency (MWA) forecast demand model to project the population to 2035.

**TABLE 2-2  
AVRWC PROJECTED POPULATION ESTIMATES**

2005	2010	2015	2020	2025	2030	2035	Annual % Change 2005-2035
58,766	62,602	68,765	74,927	82,420	89,912	97,405	2.2%

Source is MWA's 2010 demand model forecast.

AVRWC is utilizing the same forecast population and demand model that MWA created and used for its 2010 Urban Water Management Plan (UWMP). AVRWC is a purveyor within MWA's service area and supplied MWA with the necessary data input for the model. AVRWC boundaries are indicated on Figure 1-1 in the previous chapter.



### 2.3 Historic Water Use

Predicting future water supply requires accurate historic water use patterns and water usage records. Figure 2-1 illustrates the change in water demand since 2000. The dramatic drop since 2007 is most likely caused by the economic downturn of recent years and the combined effects of drought and conservation.

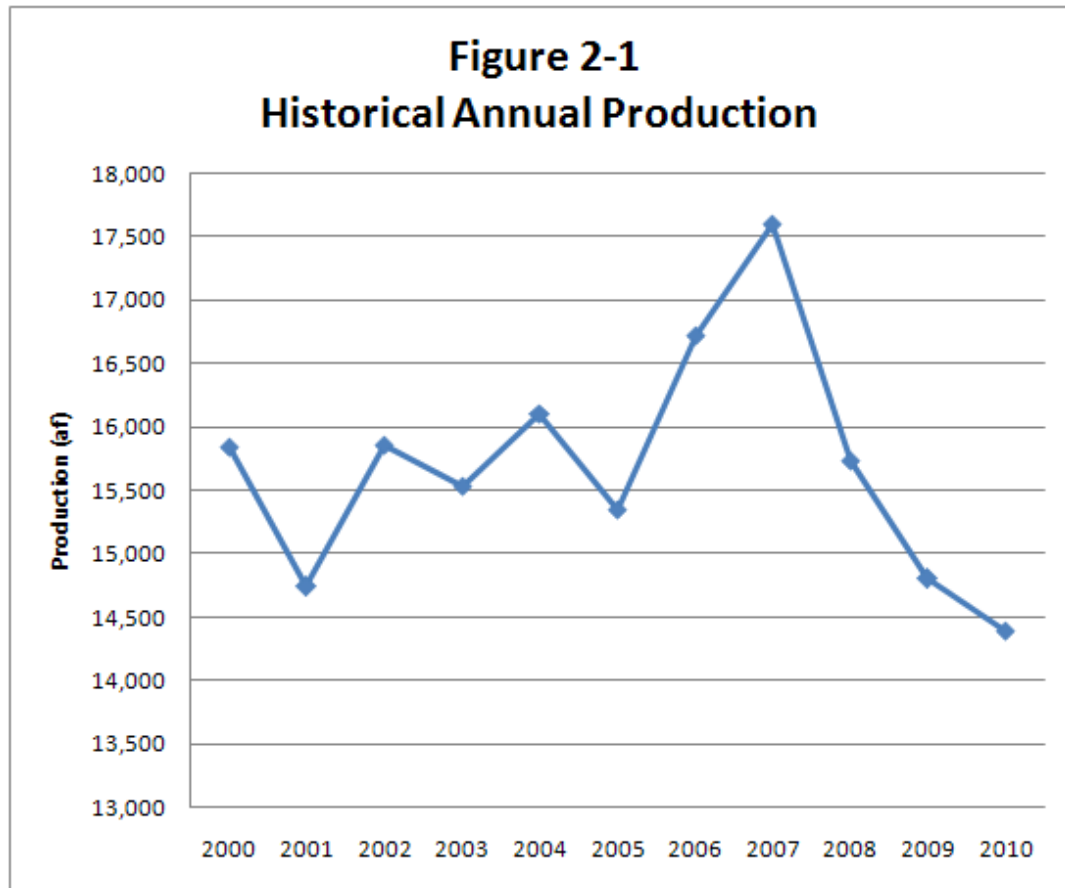


Table 2-3 presents the historical production quantities for the AVRWC from 2000 through 2010.

**TABLE 2-3**  
**ANNUAL PRODUCTION FOR AVRWC (AF)**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
AVRWC	15,847	14,741	15,853	15,536	16,100	15,346	16,723	17,605	15,735	14,801	14,390

Source: DWR PWSS data.

## 2.4 Existing and Targeted Per Capita Water Use in AVRWC Service Area

### 2.4.1 Base Daily Per Capita Water Use for SBX7-7 Reduction

As described in SBX7-7, it is the intent of the California legislature to increase water use efficiency and the legislature has set a goal of a 20 percent per capita reduction in urban water use statewide by 2020. The requirements of SBX7-7 apply to retail water suppliers. Consistent with SBX7-7, the 2010 UWMPs must provide an estimate of Base Daily Per Capita Water Use. This estimate utilizes information on population as well as base gross water use. For the purposes of this UWMP, population was estimated as described in Section 2.2. Base gross water use is defined as the total volume of water, treated or untreated, entering the distribution system of AVRWC, excluding: recycled water; net volume of water placed into long-term storage; and water conveyed to another urban water supplier. This calculation of Base Daily Per Capita Water Use is limited to AVRWC's retail service area (as described in Chapter 1).

The UWMP Act allows urban water retailers to evaluate their base daily per capita water use using a 10 or 15-year period. A 15-year base period within the range January 1, 1990 to December 31, 2010 is allowed if recycled water made up 10 percent or more of the 2008 retail water delivery. If recycled water did not make up 10 percent or more of the 2008 retail water delivery, then a retailer must use a 10-year base period within the range January 1, 1995 to December 31, 2010. Recycled water did not make up 10 percent of the 2008 delivery to the AVRWC retail area and for this reason the Base Daily Per Capita Water Use has been based on a 10-year period. In addition, urban retailers must report daily per capita water use for a five year period within the range January 1, 2003 to December 31, 2010. This 5-year base period is compared to the Target Based Daily Per Capita Water Use to determine the minimum water use reduction requirement (this is described in more detail in the following sections). Table 2-4 reports the data used to calculate the Base Daily Per Capita Water Use in gallons per capita per day (gpcd), and the 10-year and 5-year base periods.

**TABLE 2-4  
BASE DAILY PER CAPITA WATER USE**

Base Period Year		Distribution System Population	Annual System Gross Water Use (AFY)	Annual Daily Per Capita Water Use (gpcd)	10-Year Average (gpcd)	5-Year Average (gpcd)
Sequence Year	Calendar Year					
1	1995	35,563	13,454	338		
2	1996	36,044	14,314	355		
3	1997	38,210	14,890	348		
4	1998	39,565	13,344	301		
5	1999	40,815	14,874	325		
6	2000	46,081	15,847	307		
7	2001	47,549	14,741	277		
8	2002	49,686	15,853	285		
9	2003	52,553	15,536	264		
10	2004	55,182	16,100	260	<b>305.96</b>	
11	2005	58,766	15,346	233	295.50	
12	2006	61,513	16,723	243	284.32	
13	2007	60,512	17,605	260	275.50	<b>251.99</b>
14	2008	60,137	15,735	234	268.75	245.92
15	2009	60,388	14,801	219	258.10	237.59
<b>Period Selected</b>					<b>306</b>	

Note: Shaded cells show calendar years used in selected 10-year average.

#### 2.4.2 Urban Water Use Targets for SBX7-7 Reduction

In addition to calculating base gross water use, SBX7-7 requires that AVRWC identify their demand reduction targets for year 2015 and 2020 by utilizing one of four options:

- Option 1. 80 percent of baseline gpcd water use (i.e., a 20 percent reduction).
- Option 2. The sum of the following performance standards: indoor residential use (provisional standard set at 55 gpcd); plus landscape use, including dedicated and residential meters or connections equivalent to the State Model Landscape Ordinance (80 percent ETo existing landscapes, 70 percent of ETo for future landscapes); plus 10 percent reduction in baseline commercial, industrial institutional use by 2020.
- Option 3. 95 percent of the applicable state hydrologic region target as set in the DWR "20x2020 Water Conservation Plan" (February, 2010) (20x2020 Plan).
- Option 4. Not applicable.

AVRWC's service area is within the South Lahontan Hydrologic Region (#9) as defined by DWR and this hydrologic region has been assigned a 2020 water use target of 170 gpcd per the DWR 20x2020 Plan. To comply with SBX7-7, the District selects Option 1 to reduce its Base Daily Per Capita Water Use by 20 percent. This results in the 2020 gpcd target for AVRWC of 245 gpcd, as shown in Table 2-5.

**TABLE 2-5  
COMPONENTS OF TARGET DAILY PER CAPITA WATER USE**

<b>Period</b>	<b>Value</b>	<b>Unit</b>
10-year period selected for baseline gpcd	<i>First Year</i> 1995 <i>Last Year</i> 2004	
5-year period selected for maximum allowable gpcd	<i>First Year</i> 2003 <i>Last Year</i> 2007	
Highest 10-year Average	306	gpcd
Highest 5-year Average	252	gpcd
Compliance Water Use Target (20% Reduction on 10yr)	245	gpcd
Maximum Allowable Water Use Target (5% Reduction 5yr)	239	gpcd
<b>2020 Target</b>	<b>245</b>	gpcd
<b>2015 Interim Target</b>	<b>275</b>	gpcd
<b>Methodology Used</b>	Option #1	

AVRWC plans to meet the proposed 20x2020 water use target using the existing methods of conservation that have been implemented to date for the District and other methods discussed in Section 2.6.2 and Chapter 6 Demand Management Measures.

## 2.5 Projected Water Use

### 2.5.1 Water Use Data Collection

Current water use data were collected and identified by water use sector, to allow for detailed analysis and for making different assumptions about each type of water use for future years. Data was compiled from various sources, depending upon what was available. In addition to water use data, the number of residential service connections was collected to help AVRWC estimate service area population and per capita water use.

For production records, DWR annual PWSS data were used, if available, because they collect metered water deliveries by customer class and number of connections by customer class. Where DWR data were not available, water production and connection data were gathered from a combination of sources that provided a complete data set, including annual reports to the California Department of Public Health (CDPH), surveys sent to purveyors by the Alliance for Water Awareness and Conservation (AWAC), and data provided directly from AVRWC records.

### 2.5.2 Demand Forecast Methodology

AVRWC maintains historical data and works closely with property owners and developers in its service area to ensure it has an adequate water supply and the necessary infrastructure to provide water service.

Water uses were broken into five categories based on their metering records, and assumptions were made about each for projections going forward in order to be as accurate as possible. Demand projections were based largely on population growth. Please note that only the water use sectors used in AVRWC are discussed. The typical sectors that are not discussed include

Industrial, Agricultural, or Other, which are not used by AVRWC. All other sectors are explained and the assumptions used in the projection model are described below:

1. Single Family Residential (SFR): Single Family detached dwellings. SFR projections were made based upon gallons per capita per day (gpcd) and population (gpcd was converted to acre-feet per year (AFY), multiplied by yearly SFR population to calculate demand in AFY). Gallons per capita per day (gpcd) in years 2000-08 was calculated in the model by converting total SFR demand to gallons per day (gpd) and dividing by SFR population. 2008 was the baseline for gpcd projections, and gpcd is assumed to change depending upon the level of conservation that takes place in future years. The projections were made assuming the gpcd remains at the 2008 level (184 gpcd).
2. Multi-Family Residential (MFR): Multi-Family dwellings. AVRWC places this type of service in their business class.
3. Commercial/Institutional/Industrial (CII): Called Commercial/Institutional in the DWR 2009 PWSS, and defined as "Retail establishments, office buildings, laundries, schools, prisons, hospitals, dormitories, nursing homes, hotels" (not intended to include Industrial/Manufacturing). However, AVRWC included metered industrial use in with this category, primarily because they do not separate commercial and industrial customers in their billing systems. Industry included in this category is considered "baseline use" because it accounts primarily for smaller industries and workshops associated with the local population, and is expected to grow with population.

A linear regression method was used to determine the relationship between population growth and CII usage and to project forward using linear regression. Future CII demand is correlated to population using the following formula:

$$\text{CII demand} = -49.85 + 0.0295x \quad \text{where } x \text{ is the current population}$$

Because the growth is unpredictable, AVRWC does not assume any conservation in this category.

4. Landscape Irrigation: Defined in the DWR 2009 reporting instructions as "parks, play fields, cemeteries, median strips, and golf courses." This use category increased at a faster pace than population during the period of 2000-08, most likely because medians and street landscaping were developed primarily in the construction boom during that period. With 2008 as a baseline, Landscape Irrigation use is projected to increase in proportion with increases in population.
5. Unaccounted: Calculated as the difference between total water production and metered deliveries reported by purveyors. From 2000-2005, unaccounted water was 12.7 percent annually compared to total municipal production, but from 2005-2010, that number dropped to 8.5 percent. This is likely due to AVRWC's aggressive water main replacement program, performing water loss audits, and replacing 2,500 water meters per year starting in 2006. The makeup of this category is not known; however, based upon conversations with professionals in retail water distribution, it is likely that this difference is comprised of water pumped to waste from production wells, lost to leaks, system flushing, and from meter inaccuracies. With a 2008 baseline, unaccounted use is projected to increase in proportion with increases in municipal production.

### 2.5.3 Water Supply

AVRWC currently has a single source of water supply – local groundwater from the Mojave River Groundwater Basin. Imported State Water Project (SWP) water via MWA is used to recharge the Alto basin and then it is pumped by the AVRWC. In the projection model, SWP supply is expressed as an annual average, although this source varies significantly from year to year. SWP imports, along with runoff from rainfall and snowmelt from local mountains, recharge the groundwater basin.

Table 2-6 summarizes AVRWC's projected water demands through 2035, with and without conservation using the SBX7-7 requirements discussed previously in Section 2.4. Please note that AVRWC's demand projections are the same with and without conservation.

**TABLE 2-6  
PROJECTED WATER DEMANDS**

	2005	2010	2015	2020	2025	2030	2035
Water Demands <sup>(a)</sup>							
(AF)	15,346	14,390	16,547	18,034	19,844	21,652	23,462
gpcd <sup>(b)</sup>							
(No Conservation)	233	205	215	215	215	215	215
SBX7-7 Req'd gpcd <sup>(c)</sup>	N/A	306	275	245	245	245	245
SBX7-7 Savings <sup>(d)</sup>							
(AF)	N/A	0	0	0	0	0	0
Water Demands w/ Conservation <sup>(e)</sup>	N/A	14,390	16,547	18,034	19,844	21,652	23,462

Source is water production report from AVRWC in calendar years and MWA's 2010 demand model forecast.

**Notes:**

- (a) AVRWC's demand projections without conservation.
- (b) Calculated using the estimated population from Table 2-2.
- (c) See Table 2-5.
- (d) Calculated as the difference between the projected gpcd without conservation and the SBX7-7 required gpcd times the population.
- (e) AVRWC's demand projections with conservation using the SBX7-7 requirements. Please note that the demands are the same with and without conservation.

Table 2-7 present the current, and projected water deliveries by customer type for AVRWC.

**TABLE 2-7  
CURRENT AND PROJECTED WATER DELIVERIES (BY CUSTOMER TYPE) (AF)**

Water Use Sector	2005	2010	2015	2020	2025	2030	2035
Metered Single-Family	9,960	8,685	12,257	13,355	14,691	16,026	17,362
Commercial/Insti/Indust	3,583	2,580	1,979	2,161	2,382	2,603	2,824
Landscape Irrigation	424	2,188	821	894	984	1,073	1,163
Unaccounted For/System Losses	1,379	937	1,490	1,624	1,787	1,950	2,113
<b>Total</b>	<b>15,346</b>	<b>14,390</b>	<b>16,547</b>	<b>18,034</b>	<b>19,844</b>	<b>21,652</b>	<b>23,462</b>

Data Source: DWR annual PWSS data were used, unless otherwise noted. Data is in calendar year.

### 2.5.3.1 Low Income Projected Water Demands

Senate Bill 1087 requires that water use projections of a UWMP include the projected water use for single-family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county in the service area of the supplier. The County of San Bernardino's (County) 2007 General Plan last updated its housing element in April 7, 2007. The County's housing element identifies the number (up to the year 2008) and specifies general locations of low income households in the County/Town of Apple Valley. However, the housing element does not project the number or location of low-income households in the future. For this reason, it is not possible to project water use for lower income households separate from overall residential demand. However, the County will not deny or condition approval of water services, or reduce the amount of services applied for by a proposed development that includes housing units affordable to lower income households unless one of the following occurs:

- the County specifically finds that it does not have sufficient water supply,
- the County is subject to a compliance order issued by the State Department of Health Services that prohibits new water connections, or
- the applicant has failed to agree to reasonable terms and conditions relating to the provision of services.

## 2.6 Other Factors Affecting Water Usage

A major factor that affects water usage is weather. Historically, when the weather is hot and dry, water usage increases. The amount of increase varies according to the number of consecutive years of hot, dry weather and the conservation activities imposed. During cool, wet years, historical water usage has decreased, reflecting less water usage for exterior landscaping. This factor is discussed below in detail.

### 2.6.1 Weather Effects on Water Usage

California faces the prospect of significant water management challenges due to a variety of issues including population growth, regulatory restrictions and climate change. Climate change is of special concern because of the range of possibilities and their potential impacts on essential operations, particularly operations of the State Water Project. The most likely scenarios involve accelerated sea level rise and increased temperatures, which will reduce the Sierra Nevada snowpack and shift more runoff to winter months. These changes can cause major problems for the maintenance of the present water export system through the fragile levee system of the Sacramento-San Joaquin Delta. The other much-discussed climate scenario or impact is an increase in precipitation variability, with more extreme drought and flood events posing additional challenges to water managers<sup>2</sup>.

These changes to the SWP water supply would impact AVRWC by affecting how much SWP water is available, when it is available, how it can be captured and how it is used due to changes in priorities. Expected impacts to the SWP imported water supply include pumping less water south of the Delta due to reduced supply, and pumping more local groundwater to

<sup>2</sup> Final California Water Plan Update 2009 Integrate Water Management: Bulletin 160.

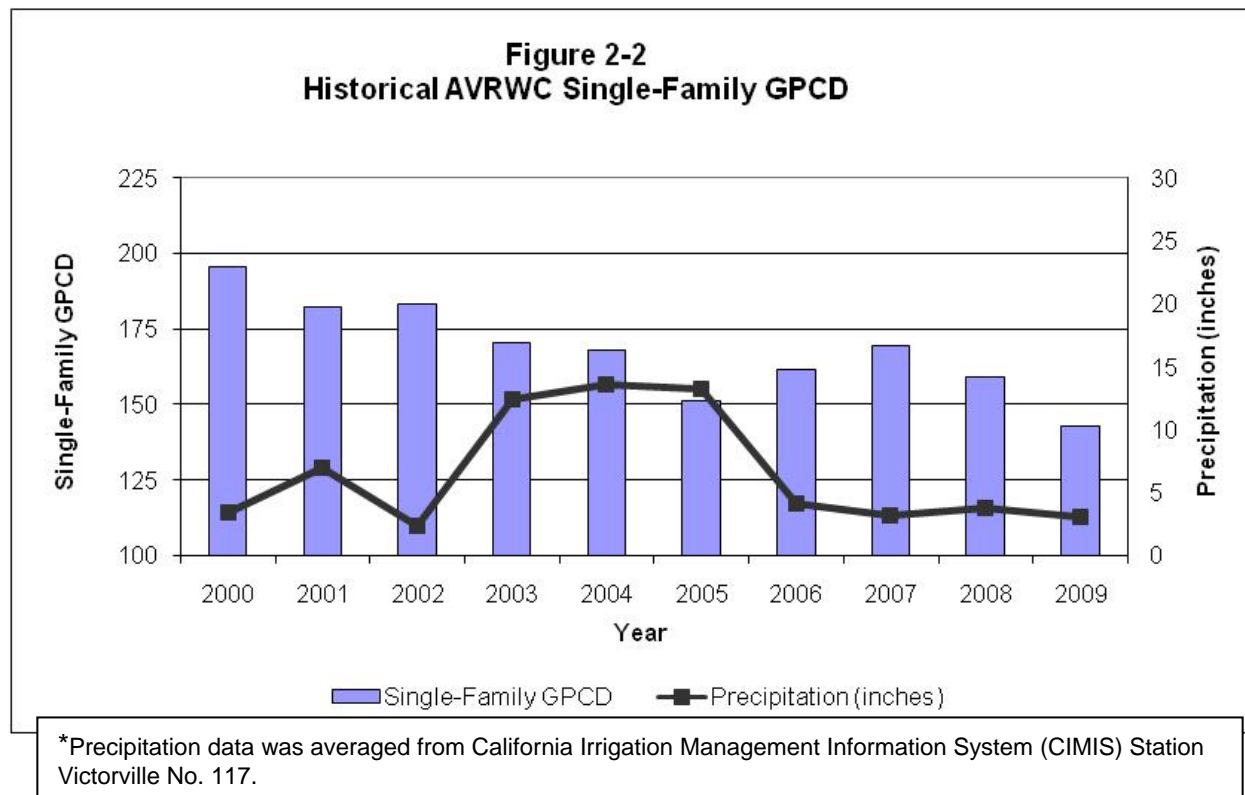
augment reductions in surface water supplies and reliability issues since groundwater is a more reliable source of water.

Historically, AVRWC's single-family sector use has fluctuated from 143 to 196 gpcd, as shown on Figure 2-2. While historically this variation in range of water use was primarily due to seasonal weather variations, with the unusual economic events of recent years and the effects of conservation, the weather may not be the only impact on the drop in usage for the single family user.

## 2.6.2 Conservation Effects on Water Usage

In recent years, water conservation has become an increasingly important factor in water supply planning in California. Since the 2005 UWMP there have been a number of regulatory changes related to conservation including new standards for plumbing fixtures, a new landscape ordinance, a state universal retrofit ordinance, new Green Building standards, demand reduction goals and more.

In 2003, AVRWC, MWA, and other water purveyors in the Mojave service area formed the AWAC. The mission of the AWAC, a coalition of 25 regional organizations, is to promote the efficient use of water and increase communities' awareness of conservation as an important tool to help ensure an adequate water supply. The AWAC have developed water conservation measures that include public information and education programs and have set a regional water use reduction goal of 15 percent gross per capita by 2015.





## Section 3: Water Resources

### 3.1 Overview

This section describes the water resources available to the Apple Valley Ranchos Water Company (AVRWC) for the 25-year period covered by the Plan. These are summarized in Table 3-1 and discussed in more detail below. Both currently available and planned supplies are discussed.

**TABLE 3-1  
SUMMARY OF CURRENT AND PLANNED WATER SUPPLIES (AFY)**

<b>Water Supply Source</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
<i>Existing Supplies</i>						
<i>Local Supplies</i>						
Groundwater from Mojave GW Basin <sup>(a)</sup>	14,390	16,547	18,034	19,844	21,652	23,462
<b>Total Existing Supplies</b>	<b>14,390</b>	<b>16,547</b>	<b>18,034</b>	<b>19,844</b>	<b>21,652</b>	<b>23,462</b>
<i>Planned Supplies</i>						
Potable Water Projects	0	0	0	0	0	0
<b>Total Supplies</b>	<b>14,390</b>	<b>16,547</b>	<b>18,034</b>	<b>19,844</b>	<b>21,652</b>	<b>23,462</b>
<b>Total Estimated Demands<sup>(b)</sup></b>	<b>14,390</b>	<b>16,547</b>	<b>18,034</b>	<b>19,844</b>	<b>21,562</b>	<b>23,462</b>

Notes:

(a) Supply is pumped from Mojave River Groundwater Basin via 23 wells.

(b) See Chapter 2 Water Use, Table 2-7.

The term "dry" is used throughout this chapter and in subsequent chapters concerning water resources and reliability as a measure of supply availability. As used in this Plan, dry years are those years when supplies are the lowest, which occurs primarily when precipitation is lower than the long-term average precipitation. The impact of low precipitation in a given year on a particular supply may differ based on how low the precipitation is, or whether the year follows a high-precipitation year or another low-precipitation year. For the Mojave Water Agency (MWA), which is the wholesaler of imported State Water Project (SWP) for AVRWC, a low-precipitation year may or may not affect supplies, depending on how much water is in SWP storage at the beginning of the year. Also, dry conditions can differ geographically. For example, a dry year can be local to the AVRWC service area (thereby affecting local groundwater replenishment and production), local to northern California (thereby affecting SWP water deliveries), or statewide (thereby affecting both local groundwater and the SWP). When the term "dry" is used in this Plan, statewide drought conditions are assumed, affecting both local groundwater and SWP supplies at the same time.

The AVRWC currently has one source of water supply – local groundwater from the Mojave River Groundwater Basin.

### 3.2 Local Water Supplies

This section discusses AVRWC local supply of water, which is comprised solely of groundwater from the Mojave River Groundwater Basin. The Mojave Water Agency's Board of Directors sits as the Watermaster for this adjudicated groundwater basin.

### 3.2.1 Groundwater

AVRWC provides potable water from 23 active wells within its service area in Apple Valley. The present capacity of these wells totals approximately 37 million gallons per day (mgd). All wells are located in the Mojave River Groundwater Basin. The Mojave River runs along the western edge of the service area. This river, which is dry much of the year, is actually the center of a large source of groundwater flowing north from the San Bernardino Mountains. Water is recharged to the basin through percolation and sub-surface flow from adjoining groundwater basins. This groundwater is the only source of supply for the AVRWC system.

The AVRWC water system facilities also include approximately 450 miles of pipeline and 11.6 million gallons (mg) of storage. Because of varying elevations, the water system is segregated into 14 active interconnected pressure zones in order to maintain appropriate pressures. The majority of the wells pump directly into the portion of the distribution system referred to as the Main Pressure Zone. This zone is equipped with elevated storage that is capable of supplying the entire system by gravity flow. AVRWC also has a small, isolated system north of Victorville, with 49 customers that are served by one well. This system has an emergency interconnect with the Victorville Water District.

Based on the production capacity of the existing wells, the maximum water that can be supplied by the current AVRWC system is 37 mgd. AVRWC has been regularly increasing the number of wells to meet the increasing demands of the Town. Four new wells have been installed since 2005, including Well Nos. 33, 34, 36, and 20R. The oldest wells were drilled beginning in 1953 with the newest well (No. 20R) being completed in 2008.

AVRWC obtains groundwater from Alto subarea of the Mojave River Groundwater Basin. The Mojave River Groundwater Basin overlies a broad hydrologic region also defined in DWR Bulletin 118-03 as the South Lahontan (region 6) hydrologic region and is listed in Table 3-2. Figure 3-1 shows the DWR groundwater basins and the MWA adjudicated groundwater basin boundaries. Figure 3-2 shows the groundwater basins within the AVRWC service area boundary.

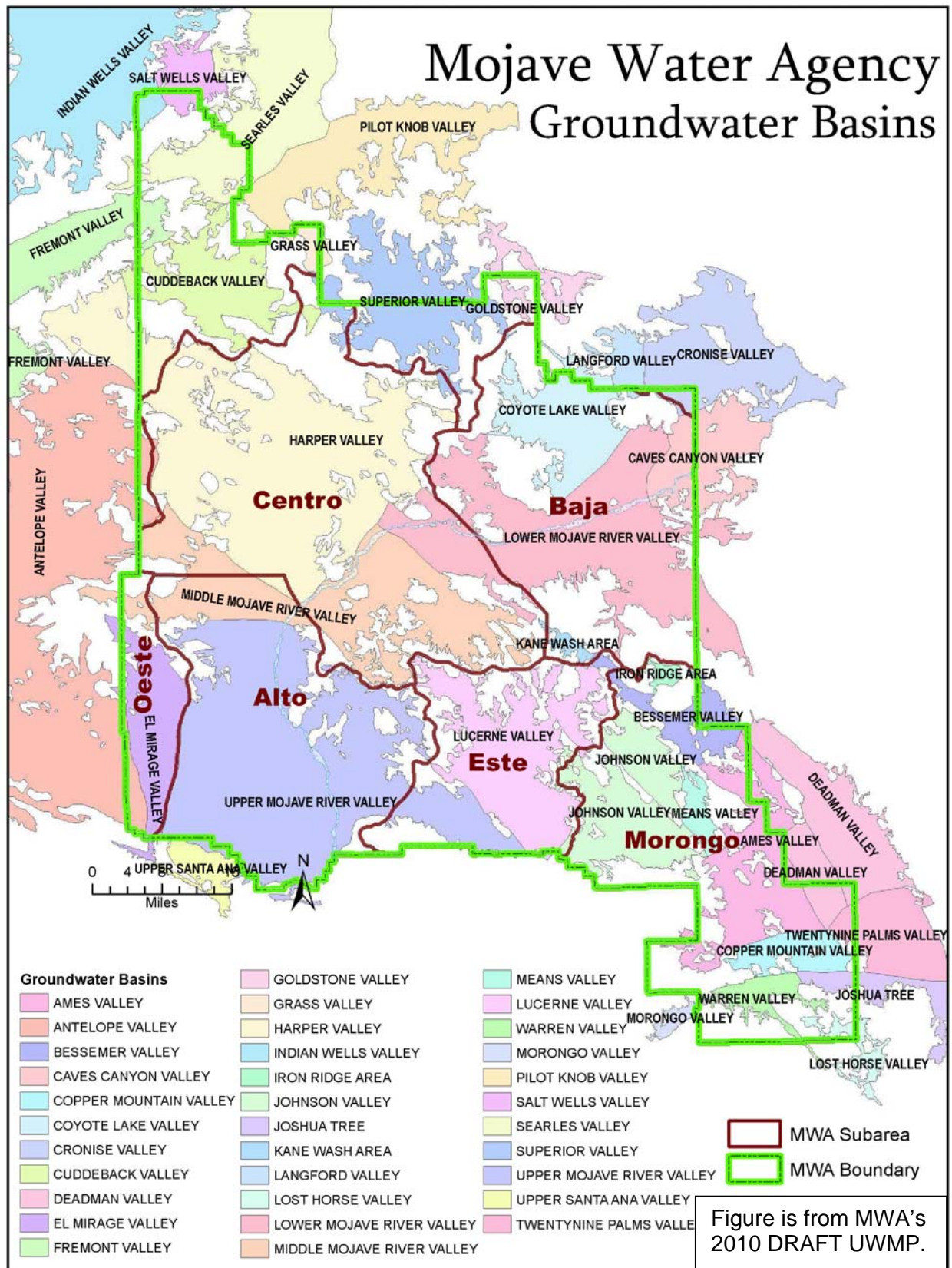
**TABLE 3-2  
DWR GROUNDWATER BASINS**

<b>DWR Basin</b>	<b>Groundwater Basin</b>	<b>Budget Type<sup>(a)</sup></b>
6-41	Middle Mojave River Valley	A
6-42	Upper Mojave River Valley	A

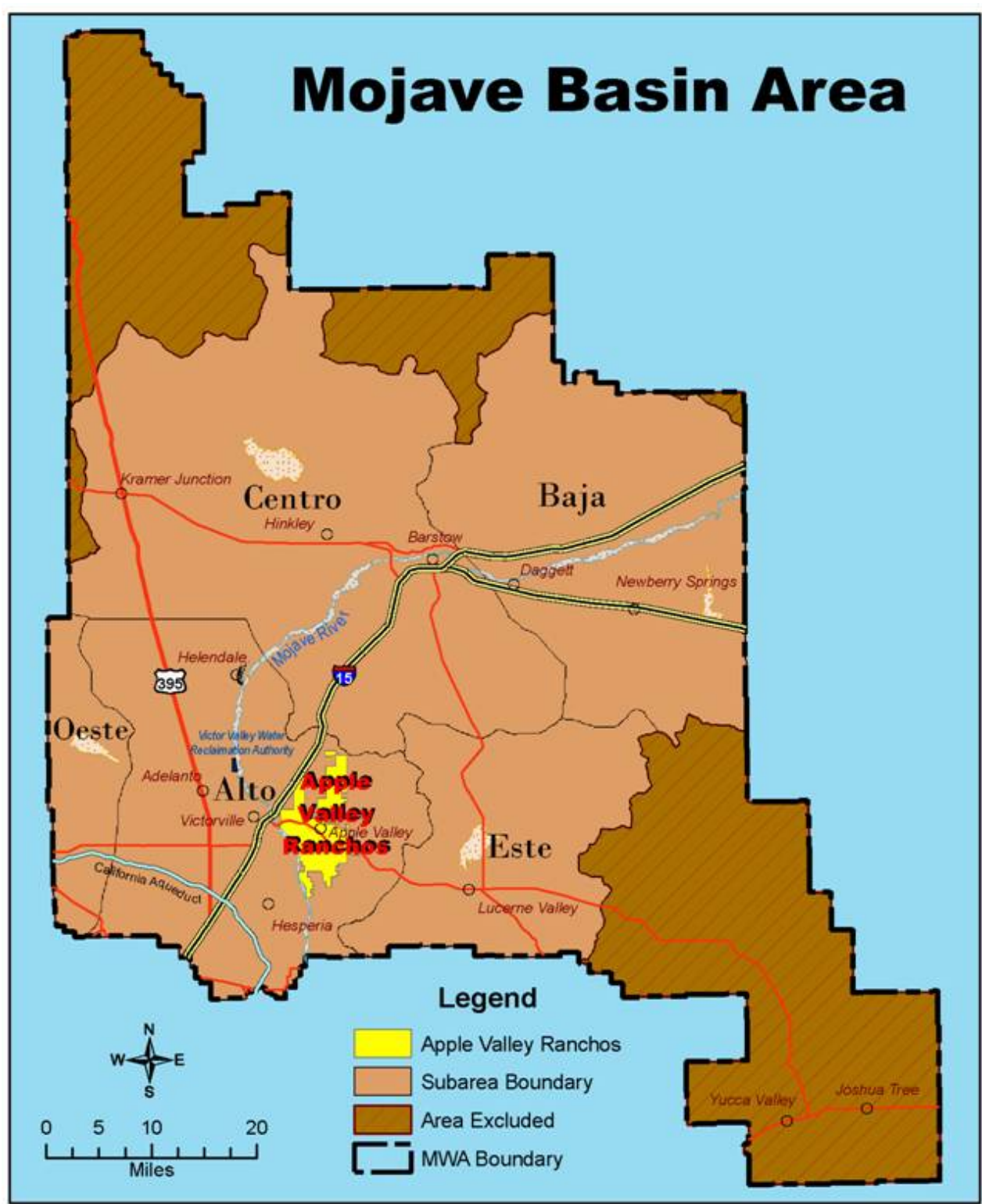
Source: DWR

Note: (a) Type A – either a groundwater budget or model exists, or actual extraction data is available.

**FIGURE 3-1**  
**DWR GROUNDWATER BASINS WITHIN MWA**



**FIGURE 3-2  
MOJAVE BASIN AREA BOUNDARIES**





### 3.2.1.1 Mojave River Groundwater Basin

This section presents information about AVRWC's groundwater supply from the Mojave River Groundwater Basin. This section includes a discussion of the objectives from the adopted MWA's 2004 Regional Water Management Plan (RWMP), adopted on February 24, 2005 which also serves as the Ground Water Management Plan (GWMP). AVRWC participated in and accepts MWA's 2004 RWMP (and GWMP).

### 3.2.1.2 Groundwater Basin Description

The groundwater basin within the AVRWC service area is the Mojave River Groundwater Basin. The entire basin encompasses a total of 1,400 square miles and has an estimated total water storage capacity of nearly 5 million acre-feet (MAF) (Bookman-Edmonston Engineering, Inc., 1994). For the purposes of this report, the large groundwater basin area is referred to as the Mojave Basin Area. The Mojave Basin Area groundwater basin has been further divided into subareas for groundwater management and/or adjudication purposes. Subareas within the Mojave River Groundwater Basin include Oeste, Alto, Este, Centro and Baja as defined in the Mojave Basin Judgment<sup>3</sup> (Appendix C for text of the Judgment) and shown on Figure 3-1. AVRWC overlies the Alto subarea, which is in the southern portion of the Mojave Basin Area.

In the Mojave River Groundwater Basin, the Mojave River is the largest stream, originating near the Cajon Pass, a low-elevation gap in the San Bernardino Mountains. With the exception of small streams in the San Gabriel and the San Bernardino Mountains and short reaches of the Mojave River, there are no perennial streams in the Mojave Basin Area. Prior to ground-water development, the Mojave River flowed at a series of discharge areas near Victorville, at Camp Cady, at Afton Canyon, and at other areas where faults cause groundwater to discharge at land surface, such as near the Helendale or the Waterman Faults. Under present-day conditions the Mojave River does not flow perennially except at the Narrows near Victorville, downstream from the Victorville municipal wastewater treatment plant (an area known locally as the "Transition Zone"), and near Afton Canyon.

The Mojave River Groundwater Basin Area is essentially a closed basin – very little groundwater enters or exits the basin. However, within the basin groundwater movement occurs between the different subareas, as well as groundwater-surface water and groundwater-atmosphere interchanges. Groundwater is recharged into the basin predominantly by infiltration of water from the Mojave River, which accounts for approximately 80 percent of the total basin natural recharge. Other sources of recharge include infiltration of storm runoff from the mountains and recharge from human activities such as irrigation return flows, wastewater discharge, and enhanced recharge with imported water. Over 90 percent of the basin groundwater recharge originates in the San Gabriel and San Bernardino Mountains. Groundwater is discharged from the basin primarily by well pumping, evaporation through soil, transpiration by plants, seepage into dry lakes where accumulated water evaporates, and seepage into the Mojave River.

<sup>3</sup> Mojave Basin Area Judgment, 1996. *Judgment After Trial, City of Barstow et al. Vs. City of Adelanto et al.* Superior Court Case No. 208568, Riverside County, CA.

Recent investigations by the MWA, US Geological Survey (USGS), and others have resulted in an improved understanding of the geology and hydrogeology of the Mojave Basin Area. Specifically, a more refined examination of the hydrostratigraphy has allowed for differentiation between the more permeable Floodplain Aquifer that has a limited extent along the Mojave River and the more extensive but less permeable Regional Aquifer. The aerial extent of the Floodplain and Regional aquifers is shown on Figure 3-3. In the Mojave Basin Area, Alto, Centro, and Baja subareas contain both the Floodplain Aquifer and the Regional Aquifer while Oeste and Este subareas only contain the Regional Aquifer.

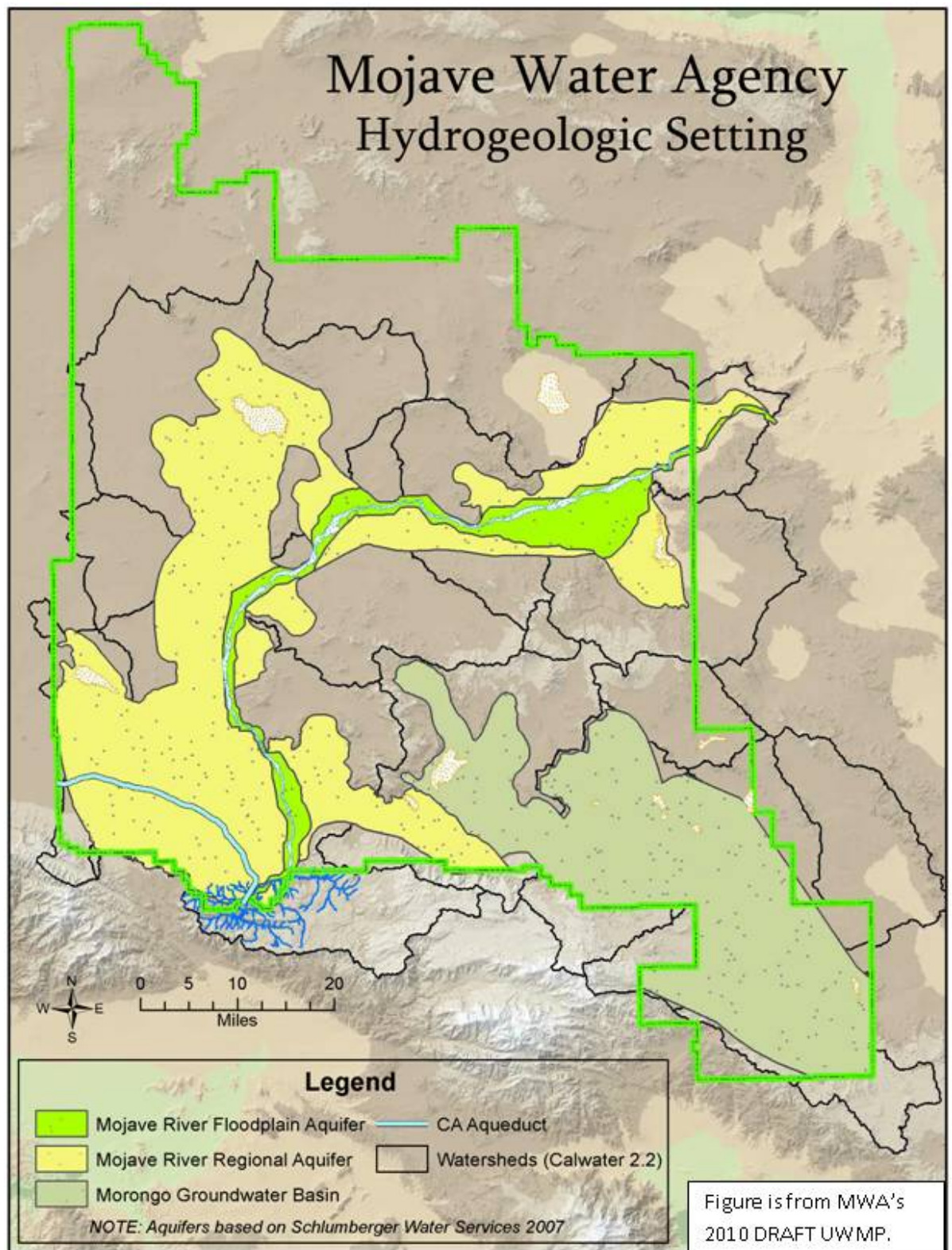
The Floodplain Aquifer is composed of sand and gravel weathered from granitic rocks of the San Gabriel and the San Bernardino Mountains and deposited in a fluvial depositional environment. These highly permeable sediments can yield large quantities of water to wells. The Floodplain Aquifer is directly recharged by infiltration of surface flows from the Mojave River during the winter rainy season (Figure 3-3). Recharge is greater near the mountain front where surface flows are more frequent.

The Regional Aquifer underlies and surrounds the Floodplain Aquifer with interconnected alluvial fan and basin fill deposits that drain toward the Mojave River (Figure 3-3). In some areas, permeable deposits from the ancestral Mojave River are present, but overall the aquifer is much less permeable than the Floodplain Aquifer. The Regional Aquifer is generally recharged by groundwater movement from the Floodplain Aquifer to the Regional Aquifer, infiltration of runoff from the higher altitudes of the San Gabriel and San Bernardino Mountains, and smaller amounts of runoff from local intermittent streams and washes.

Prior to recent population growth, most of the groundwater production occurred in the Floodplain Aquifer. Groundwater production was initially developed along the Mojave River in the early 1900s. In the mid-1950's, groundwater production had increased to about 190,000 AF, with most of the production still occurring along the river. By 1994, about half of the total basin production came from wells located away from the Mojave River in the Regional Aquifer. The increase in water production and the re-distribution of pumping in the basin have significantly influenced the interaction between the Floodplain and Regional Aquifers. Prior to development in the area, groundwater flowed primarily from the Regional Aquifer into the Floodplain Aquifer. However, vertical groundwater gradients have been reversed in recent years, and downward flow from the Floodplain Aquifer is currently the primary recharge mechanism for the Regional Aquifer.

Essentially all water supplies within MWA are pumped from the local groundwater basins and groundwater levels generally have been declining for the past 50 years or more. Adjudication proceedings were initiated due to concerns that rapid population growth would lead to further overdraft. The resulting Mojave Basin Area Judgment requires that additional surface water be imported to help balance the basins.

**FIGURE 3-3  
HYDROGEOLOGIC SETTING**



Alto subarea water levels near the Mojave River are relatively stable exhibiting seasonal fluctuations with rising levels in winter and declining levels in summer. It is expected that under current pumping conditions and long-term average flows in the river, water levels in the Floodplain Aquifer will generally remain stable. Water levels in the western portion of Alto in the Regional Aquifer exhibit declines consistent with heavy pumping and limited local recharge. Water levels in the eastern portion of Alto indicate similar trends although to a lesser extent; most likely due to limited pumping in the regional aquifer east of the river and possibly higher localized septic return flow due to the lack of sewers in some areas. Continued pumping in depleted areas of the Regional Aquifer may result in long-term local negative impacts such as declining yields and water quality problems. As a whole, the Alto subarea appears to be in regional balance although portions of the subarea have shown continued historical declines.

#### **3.2.1.2.1 Adopted Groundwater Management Plan**

In February 2005, MWA formally adopted its 2004 Regional Water Management Plan Update (RWMP), which also serves as the Groundwater Management Plan (GWMP) (Appendix D). The 2004 RWMP both complements and formalizes a number of existing water supply and water resource planning and management activities in the MWA service area that overlies the Alto subarea of the Mojave River Groundwater Basin and several groundwater basins, as defined by DWR in Bulletin 118.

#### **3.2.1.2.2 Available Groundwater Supplies**

Recent and projected groundwater pumping within the Alto subarea of the Mojave Basin Area is summarized in Tables 3-4 and 3-5, respectively. In the Mojave Basin Area, Base Annual Production (BAP) rights were assigned by the Mojave Basin Area Judgment to each producer using 10 AFY or more, based on historical production. BAP is defined as the producer's highest annual use verified for the five-year base period from 1986-90. Parties to the Judgment are assigned a variable Free Production Allowance (FPA) by the Watermaster, which is a percentage of BAP set for each subarea for each year. The allocated FPA represents each producer's share of the water supply available for that subarea. This FPA is reduced or "ramped-down" over time until total FPA comes into balance with available supplies.

Production Safe Yield (PSY) is determined for each subarea within the Mojave River Groundwater Basin. The PSY in each subarea is assumed to equal the average net natural water supply plus the expected return flow from the previous year's water production. Exhibit H of the Judgment requires that in the event the FPA exceeds the estimated PSY by five percent or more of BAP, Watermaster recommends a reduction in FPA equal to, but not more than, a full five percent of the aggregate subarea BAP. Any water user that pumps more than their FPA in any year is required to buy "Replacement Water" equal to the amount of production in excess of the FPA. Replacement Obligations can be satisfied either by paying the Mojave Basin Area Watermaster to purchase imported water from MWA or by temporarily transferring unused FPA within that subarea from another party to the Judgment.

Under the Judgment's terms, AVRWC may produce as much groundwater as needed to satisfy its customer demands within its service area. AVRWC has been assigned Base Annual Production (BAP) rights of 13,330 AFY, as summarized in Table 3-3. AVRWC is located within the Alto Subarea and has a projected FPA of 60 percent (7,998 AFY) from 2010 to 2035.



**TABLE 3-3  
GROUNDWATER PUMPING RIGHTS**

Entity	BAP <sup>(a)</sup> (AFY)	AVRWC Service Area	
		BAP (AFY)	2005 – 2010 FPA <sup>(b)</sup> (AFY)
Alto Subarea	116,412	13,330	7,998

Source is Annual Watermaster Reports.

Notes:

(a) BAP – Base Annual Production (adjudicated amount).

(b) FPA – Free Production Allocation (currently 60 percent of BAP for municipal and industrial).

Recent historical and projected groundwater pumping for the AVRWC service area from the Alto subarea of the Mojave River Groundwater Basin is summarized in Tables 3-4 and 3-5.

**TABLE 3-4  
HISTORICAL AVRWC GROUNDWATER PRODUCTION (AFY)**

	2005	2006	2007	2008	2009
AVRWC	15,346	16,723	17,605	15,735	14,801

Source: Table 2-3 of Chapter 2.

**TABLE 3-5  
AVRWC PROJECTED GROUNDWATER PRODUCTION (AFY)**

	2010	2015	2020	2025	2030	2035
AVRWC	14,390*	16,547	18,034	19,844	21,652	23,462

Source: Table 3-1.      \*2010 data is verified.

Table 3-6 summarizes the net average annual water supply estimates for AVRWC. There are no direct deliveries of imported water supply to AVRWC. However, the AVRWC relies on water imported by MWA through the SWP to replenish the local groundwater. The long-term average natural supply is shown under single-dry and multiple-dry years as well as average years because the long-term average includes dry periods, and any single or multiple-year dry cycle does not impact the long-term yield of the basin.

**TABLE 3-6  
AVRWC GROUNDWATER BASIN SUPPLY RELIABILITY**

Anticipated Supply	Normal Year <sup>(a)</sup> (AFY)	Single-Dry Water Year (AFY)	Multiple Dry Water Year (AFY)
AVRWC	23,462	23,462	23,462

Note:

(a) Table 3-5.

### Adequacy of Supply

All of the water used within AVRWC is supplied by pumping groundwater. The physical solution to the Mojave Basin Judgment sets limits on the amount of groundwater production that can occur within the Alto subarea without incurring an obligation to buy imported water. Subareas upstream have an annual obligation to provide specific inflows to subareas downstream based on long-term averages between 1931 and 1990.

Because water use within the AVRWC service area is supplied entirely by groundwater, AVRWC does not have any inconsistent water sources that cause reduced deliveries to users within the service area. Natural supply estimates are based on the long-term averages which account for inconsistency in supplies (i.e. historic periods of drought are included in the long-term average). A potential exception is any area where water quality could limit use as a potable supply. Wellhead treatment or provision of an alternative supply is planned for these areas.

### **Sustainability**

AVRWC is allowed to produce as much water as it needs annually to meet its requirements, subject only to compliance with the physical solution set forth in the Mojave Basin Area Judgment. An underlying assumption of the Judgment is that sufficient water will be made available to meet the needs of the Basin in the future from a combination of natural supply, imported water, water conservation, water reuse and transfers of FPA among parties.

The Watermaster for the Mojave River Groundwater Basin, MWA, is actively operating recharge sites for conjunctive use along the Mojave River Pipeline. Recharge sites including Hodge, Lenwood, Daggett, Newberry Springs, and Rock Springs Outlet provide MWA with the ability to recharge State Water Project (SWP) water into subareas where replacement water is purchased. These sites also provide MWA with the ability to bank excess SWP water as available.

#### **3.2.2 Potential Supply Inconsistency**

Water provided to customers within the service area of AVRWC is groundwater from the Company's 23 active wells. There are no inconsistent water sources that cause reduced deliveries to users within the service area. A potential exception may be the use of a well with water quality issues that may prohibit the pumping of that particular well.

### **3.3 Transfers, Exchanges, and Groundwater Banking Programs**

In addition to groundwater, AVRWC and MWA are currently exploring opportunities to purchase water supplies from other water agencies and sources. Transfers, exchanges, and groundwater banking programs, such as those described below, are important elements to enhancing the long-term reliability of the total mix of supplies currently available to meet the needs.

#### **3.3.1 Transfers and Exchanges**

An opportunity available to AVRWC to increase water supplies is to participate in voluntary water transfer programs. Since the drought of 1987-1992, the concept of water transfer has evolved into a viable supplemental source to improve supply reliability. The initial concept for water transfers was codified into law in 1986 when the California Legislature adopted the "Katz" Law (California Water Code, Sections 1810-1814) and the Costa-Isenberg Water Transfer Law of 1986 (California Water Code, Sections 470, 475, 480-483). These laws help define parameters for water transfers and set up a variety of approaches through which water or water rights can be transferred among individuals or agencies.

According to the California Water Plan Update 2009, up to 27 MAF per year of water are delivered for agricultural use every year. Over half of this water use is in the Central Valley, and

much of it is delivered by, or adjacent to, SWP and Central Valley Project (CVP) conveyance facilities. This proximity to existing water conveyance facilities could allow for the voluntary transfer of water to many urban areas, including AVRWC, via the MWA and imported SWP. Such water transfers can involve water sales, conjunctive use and groundwater substitution, and water sharing and usually occur as a form of spot, option, or core transfers agreement. The costs of a water transfer would vary depending on the type, term, and location of the transfer. The most likely voluntary water transfer programs would probably involve the Sacramento or southern San Joaquin Valley areas.

One of the most important aspects of any resource planning process is flexibility. A flexible strategy minimizes unnecessary or redundant investments (or stranded costs). The voluntary purchase of water between willing sellers and buyers can be an effective means of achieving flexibility. However, not all water transfers have the same effectiveness in meeting resource needs. Through the resource planning process and ultimate implementation, several different types of water transfers could be undertaken.

### 3.3.2 Opportunities for Short and Long-Term Transfers and Exchanges

Since AVRWC is a retailer within the MWA service area, its transfer and exchange opportunities are somewhat limited. However, MWA has, on behalf of AVRWC and all its retailers, participated in significant SWP Table A transfers and exchanges, thus augmenting local water supplies. It is assumed that MWA will continue to participate in such programs.

### 3.3.3 Groundwater Banking Programs

With recent developments in conjunctive use and groundwater banking, significant opportunities exist to improve water supply reliability for AVRWC. Conjunctive use is the coordinated operation of multiple water supplies to achieve improved supply reliability. Most conjunctive use concepts are based on storing groundwater supplies in times of surplus for use during dry periods and drought when surface water supplies would likely be reduced.

Groundwater banking programs involve storing available SWP surface water supplies during wet years in groundwater basins. Water would be stored either directly by surface spreading or injection, or indirectly by supplying surface water to farmers for their use in lieu of their intended groundwater pumping. During water shortages, the stored water could be pumped out and conveyed through the California Aqueduct through MWA to AVRWC as the banking partner. Several conjunctive use and groundwater banking opportunities are available to AVRWC.

MWA has its own conjunctive use program to take advantage of the fact that the available MWA SWP supply on average is still greater than the demand in the service area. MWA is able to store this water for future use when SWP supplies are not available. This activity also allows MWA to take advantage of wet year supplies because of the abundant groundwater storage available in the Basins. In 2006, MWA adopted a "Water Banking Policy" to guide the Agency in determining where water will be "banked." Banking targets (maximums) were established for each subarea where banking may occur under this Policy and to prioritize where available water will be banked. The targets are generally based on the calculation of three times the non-agricultural water demand (production) within a subarea.

### 3.4 Development Of Desalination

The California UWMP Act requires a discussion of potential opportunities for use of desalinated water (Water Code Section 10631[j]). AVRWC has evaluated opportunities for using desalinated water in future supply options. However, at this time, none of the opportunities are practical or economically feasible for AVRWC, and AVRWC has no current plans to pursue them. Therefore, desalinated supplies are not included in the supply summaries in this Plan. However, should a future opportunity emerge for AVRWC to consider development of desalination, these potential future supply opportunities are described in the following section, including opportunities for desalination of brackish water, groundwater, and seawater.

#### 3.4.1 Opportunities for Brackish Water and/or Groundwater Desalination

As discussed in Chapter 4, the groundwater supplies in the AVRWC service area are not considered brackish in nature, and desalination is not required. There are brackish supplies near the dry lakes but it is not practical to pump, treat and potentially induce migration of better quality water to the dry lake areas and potentially cause subsidence. However, AVRWC and MWA could team up with other SWP contractors and provide financial assistance in construction of other regional groundwater desalination facilities in exchange for SWP supplies. The desalinated water would be supplied to users in communities near the desalination plant, and a similar amount of SWP supplies would be exchanged and allocated to AVRWC /MWA from the SWP contractor. A list summarizing the groundwater desalination plans of other SWP contractors is not available; however, AVRWC would begin this planning effort should the need arise.

In addition, should an opportunity emerge with a local agency other than an SWP contractor, an exchange of SWP deliveries would most likely involve a third party, such as MWA. Most local groundwater desalination facilities would be projects implemented by other retailers of SWP contractors and, if an exchange program was implemented, would involve coordination and wheeling of water through the MWA contractor's facilities to AVRWC.

#### 3.4.2 Opportunities for Seawater Desalination

Because AVRWC is not in a coastal area, it is neither practical nor economically feasible for AVRWC to implement a seawater desalination program. However, similar to the brackish water and groundwater desalination opportunities described above, AVRWC could provide financial assistance to other retailers and/or team with MWA to provide financial assistance in the construction of other purveyor's seawater desalination facilities in exchange for SWP supplies.

### 3.5 Recycled Water Plan

This section of the Plan describes the existing and future recycled water opportunities available to the AVRWC service area. The description includes estimates of potential supply and demand for 2010 to 2035 in five year increments. The Victor Valley Wastewater Reclamation Authority (VWVRA) is a Joint Powers Authority that provides treatment and distribution of recycled water for its member entities, which include the Town of Apple Valley, the cities of Hesperia and Victorville, the Southern California Logistics Airport, and San Bernardino County

Services Areas 42 (Oro Grande) and 64 (Spring Valley Lake). This chapter identifies existing and projected wastewater flows by the VVWRA within AVRWC service area, and potential opportunities for the use of recycled water.

The Town of Apple Valley's wastewater is treated by the VVWRA, which shares a common interest in maximizing the beneficial uses of treated wastewater. Since the Town of Apple Valley (Town) is also the local planning agency with an adopted general land use plan, coordination is necessary between the Town and AVRWC so the location of future growth is known and accommodations provided. On August 11, 2009 the Apple Valley Town Council adopted the 2009 General Plan and certified the Environmental Impact Report.

### 3.5.1 Town of Apple Valley

The local wastewater collection system is owned, operated and maintained by the Town of Apple Valley. The Town's Sewer Master Plan was last updated in 1993. It identified the wastewater facilities needed to serve development within the Town. The Town has issued a Request for Qualifications for a Sewer Master Plan update during fiscal year 2011-2012 to ensure that the system is adequate to serve the future needs of the Town and its Sphere of Influence.

Wastewater is collected via pipelines ranging in diameter from 6 to 24 inches. Wastewater is conveyed to the VVWRA Regional Wastewater Treatment Plant (RWWTP) in Victorville via two regional intercept lines. Both lines are owned and maintained by the VVWRA. Currently, the RWWTP's capacity is 18 mgd. Currently, VVWRA is not using any recycled water in the AVRWC's service area and all tertiary treated wastewater is discharged into the Mojave River Groundwater Basin.

Approximately 30 percent of development in the Town is connected to sewer facilities. Unsewered development is served by on-lot septic systems. The Town's Sewer Connection Policy, adopted in 2006, requires that new development with total gross lot sizes of less than one acre and within one-half mile of existing sewer facilities connect to the Town's collection system. For developments more than one-half mile from existing facilities, developers must install dry sewers, or with the approval of the California Regional Water Quality Control Board (RWQCB), developers may install interim "Holding Tank System" to create a working collector sewer system within the development. Ultimately, all new development is to be connected to the community sewage collection system.

The cost to transport wastewater from many areas of the Town that are outside the existing wastewater treatment system to the VVWRA is considered prohibitive. To address this issue, the Town has identified areas where sub-regional wastewater treatment plants might be located to serve existing and future development.

The Town's projected average wastewater flows are summarized in Table 3-7.

**TABLE 3-7  
TOWN OF APPLE VALLEY  
PROJECTED AVERAGE WASTEWATER FLOW**

<b>Year</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
Wastewater Flow (mgd) <sup>(a)</sup>	1.84	2.22	2.60	2.98	3.36	3.74

Note:

(a) Per VVWRA Flow Projection Update, April 2009. Prepared by RBF Consulting. Source document only projects to Year 2022, so it is assumed that from 2022-2035, the same growth rate will continue as previously estimated.

### 3.5.2 Planned VVWRA Improvements and Expansions

Since 2005, VVWRA has violated water discharge requirements as set forth by the Lahontan Regional Water Quality Control Board (LRWQCB). Specifically, in February 2008, the Regional Board issued Cease and Desist Order R6V-2008-005 due to VVWRA discharge affecting the water quality for municipal and domestic supply. The discharge caused nitrate-nitrogen concentrations in underlying groundwater to exceed or threaten to exceed a water quality objective in the Basin Plan.<sup>4</sup>

The Order states that the existing RWWTP does not include wastewater treatment for nitrogen removal and facilities that provide nitrogen will not be constructed until 2009-2011. Among the requirements of the Order, interim effluent limitations for ammonia-nitrogen and nitrate-nitrogen removal were specified. Additionally, the Order specifies facility improvement actions to occur in less than five years.

A revised Phase III upgrade project to the RWWTP is anticipated to have improved nitrogen removal technology and be able to meet the new permit effluent limits by mid-2012. The RWWTP is currently capable of treating a portion of the flow to a tertiary level and the remaining flow to a secondary level for percolation. A majority of the tertiary treated wastewater is discharged into the Mojave River Basin and a smaller amount is currently used to irrigate landscaping at the treatment plant and the nearby Westwinds Golf Course in the City of Victorville. The capacity of the RWWTP was increased to its current 18.0 mgd capacity in 2009. Also, Regional Board Order R6V-2008-004 along with the National Pollutant Discharge Elimination System (NPDES) Permit No. CA 0102822 allows the RWWTP to discharge up to 14.0 mgd of tertiary-treated effluent to surface water, which is the Mojave River.

As an additional measure to mitigate the reduced capacity from the nitrogen removal required, VVWRA is planning to construct sub-regional wastewater treatment plants in the Town of Apple Valley, the City of Hesperia, and a possible third location yet to be determined. These smaller plants will recycle water for local landscape irrigation near the site of treatment. In turn, this will reduce the treatment demand on the RWWTP. Moreover, the Hesperia and South Apple Valley interceptors are reaching capacity and the new sub-regional plants will provide a long-term solution. Constructing sub-regional treatment plants to capture and treat wastewater in Hesperia and Apple Valley would free up capacity at the RWWTP for the City of Victorville, CSA 42, and CSA 64.

<sup>4</sup> Local Agency Formation Commission County of San Bernardino Staff Report, October 9, 2009.

In the long-run, the capacity of the sub-regional plants, pump stations, and percolation ponds will require future expansion in order to meet the processing demands generated by Apple Valley and Hesperia. Additionally, it is likely that the sub-regional plants will require the same level of regulatory compliance regarding nitrate-nitrogen as the RWWTP. The estimated completion date of the sub-regional plants is unknown.

The conceptual details of the sub-regional plants are:

- **Town of Apple Valley**  
1.0 mgd facility located in the Town, adjacent to the Otoe Road Pump Station in the southwest corner of Brewster Park. The facility will initially have a capacity to treat 1.0 mgd, expandable to 4.0 mgd, providing recycled water to the public parks.
- **City of Hesperia**  
1.0 mgd facility located on City-owned park property along Mojave Street just west of Maple Avenue in the City of Hesperia. The facility will initially have a capacity to treat 1.0 mgd, expandable to 4.0 mgd, providing recycled water to residential subdivisions, parks, and municipal buildings throughout the City.

According to VVWRA, the Apple Valley sub-regional plant is estimated at a total project cost of \$27.4M.

### 3.5.3 Potential and Projected Use

The VVWRA has identified no potential users for recycled water in Apple Valley at this time, nor has the Town of Apple Valley investigated potential recycled water users in their service area. Therefore, there is no projected recycled water use for AVRWC.

### 3.5.4 Optimization and Incentives for Recycled Water Use

As the owner and operator of the Regional Treatment Plant, the VVWRA is responsible for determining the technical and economic feasibility of supplying recycled water to the potential users in the Town of Apple Valley. Because the VVWRA recycled water system is still in the initial planning stages, there are no actions in place at this time by which VVWRA or AVRWC is encouraging the use of recycled water in the water system.





## Section 4: Water Quality

---

### 4.1 Overview

The quality of any natural water is dynamic in nature. This is true for the Mojave River water and the imported State Water Project (SWP) water brought into the Apple Valley area via the Mojave Water Agency (MWA). During periods of intense rainfall or snowmelt, routes of surface water movement are changed; new constituents are mobilized and enter the water while other constituents are diluted or eliminated. These same basic principles apply to groundwater. Depending on water depth, groundwater will pass through different layers of rock and sediment and leach different materials from those strata. Water quality is not a static feature of water, and these dynamic variables must be recognized.

Water quality regulations also change. This is the result of the discovery of new contaminants, changing understanding of the health effects of previously known as well as new contaminants, development of new analytical technology, and the introduction of new treatment technology. All water purveyors are subject to drinking water standards set by the U.S. Environmental Protection Agency (EPA) and the California Department of Public Health (CDPH). Apple Valley Ranchos Water Company (AVRWC, Company) extracts water from groundwater basins for delivery. An annual Consumer Confidence Report (CCR) is provided to all residents who receive water from the Company. That report includes detailed information about the results of quality testing of the water supplied during the preceding year.

Several state, regional and county agencies have jurisdiction and responsibility for monitoring water quality and contaminant sites. Programs administered by these agencies include basin management, waste regulation, contaminant cleanup, public outreach, and emergency spill response.

This section provides a general description of the water quality of both imported water and existing groundwater supplies. A discussion of potential water quality impacts on the reliability of these supplies is also provided.

### 4.2 Imported Water Quality

The Mojave Water Agency (MWA) is AVRWC's wholesale supplier for SWP water. MWA provides imported SWP water to agencies within its service area. MWA receives SWP water at four locations off the aqueduct. The first of four turnouts to the MWA service area is located at Sheep Creek, which is essentially a stub out in the Phelan Area and not used at this time. Second is the Mojave River turnout, also known as the White Road Siphon, located southwest of the City of Victorville and serves the Mojave River Pipeline. SWP water is transported to the Mojave River Groundwater Basin via the Mojave River Pipeline, which extends approximately 76 miles from the California Aqueduct to recharge sites along the Mojave River.

MWA uses the imported water supply for recharge into the Mojave River Groundwater Basin. AVRWC withdraws all of its water from the Alto subarea of the Mojave River Groundwater Basin.

Data regarding the quantity and quality of SWP water delivered to the MWA service area is readily available from the California Department of Water Resources (DWR). Although the quality of SWP water varies seasonally, for the period between 2005 and 2009 the average total dissolved solids (TDS) concentration has been approximately 268 mg/L for the Apple Valley area.

### 4.3 Groundwater Quality

AVRWC currently obtains its groundwater from twenty-three (23) active wells in the Mojave River Groundwater Basin. According to the Company's 2009 CCR, groundwater quality currently meets all the regulatory requirements. There have been no contaminants detected that exceed any federal or state drinking water standards. Hundreds of samples analyzed every month and thousands every year by AVRWC contract certified laboratories assure that all primary (health related) and secondary (aesthetic) drinking water standards are being met.

### 4.4 Groundwater Protection

The general goal of groundwater protection activities is to maintain the groundwater and the aquifer to ensure a reliable high quality supply. Activities to meet this goal include continued and increased monitoring, data sharing, education and coordination with other agencies that have local or regional authority or programs. AVRWC currently operates twenty-three (23) active groundwater production wells. To increase its groundwater protection activities, AVRWC has been taking the following actions as presented below.

#### 4.4.1 Water Quality Monitoring

Since 1990, community water systems in California have been providing an Annual Water Quality Report to customers under regulations adopted in 1989 by the CDPH. However, the 1996 amendments to the Federal Safe Drinking Water Act and recently adopted federal regulations now require a "Consumer Confidence Report." In addition, California law now requires a similar report to consumers.

This report must contain information on the quality of water delivered by the system and characterize any risks from exposure to contaminants detected in the drinking water. Contaminant levels have previously had a MCL. The Federal Government has now established a Maximum Contaminant Level Goal (MCLG) for each constituent that has an MCL. The State of California is currently establishing their own Public Health Goal (PHG) for each of the same contaminants. Where the State has not yet set a PHG, the requirement levels noted in the tables on the following pages refer to the federal MCLG.

#### 4.4.2 Wellhead Protection

Since California has not developed a wellhead protection program, the groundwater portion of the Drinking Water Source Assessment and Protection (DWSAP) Program serves as the wellhead protection program for the State since 1999. The Program consists of drinking water source assessment and source water protection elements. For example, activities such as inventory of possible contaminating activities (PCAs) and vulnerability analysis are part of a complete DWSAP that target protecting the water resources.

#### 4.4.3 Identification and Destruction of Abandoned Wells

The presence of abandoned groundwater wells represents a potential hazard to the quality of the groundwater basin. Abandoned and improperly destroyed wells can act as conduits for contaminants to reach drinking water supplies. It is vital for the long-term protection of the basin that abandoned wells be located and destroyed.

While it is the landowner's responsibility to destroy an abandoned well, local water agencies should be proactive about making sure that abandoned wells are in fact destroyed. The destruction of abandoned groundwater wells should be performed in accordance with state standards. California Water Code Section 13750.5 requires that those responsible for the destruction of water wells possess a C-57 Water Well Contractor's License. Whenever a water well is destroyed, a report of completion must be filed with the California DWR within 60 days of the completion of the work. The San Bernardino County (County) Department of Public Health, Division of Environmental Health Services is responsible for permitting and inspecting construction and destruction of wells.

For all functional and abandoned wells, a "well site control zone," the area immediately surrounding the well alternatively referred to as the "wellhead," needs to be established. The purpose of this zone is to provide protection from vandalism, tampering, or other threats at the well site. The size of this zone can be determined by using a simple radius, or an equivalent area. The well site control zone should be managed to reduce the possibility of surface flows reaching the wellhead and traveling down the unprotected casing. CDPH recommends a minimum radius of 50 feet for well site control zones for all public water systems in the state. The Program applies to the abandoned wells as well as functional activities that could potentially lead to "source water contamination" according to EPA regulations.

#### 4.4.4 Hazardous Materials Response

Currently, county hazardous materials teams handle responses to hazardous materials incidents. Increased coordination between AVRWC and hazardous materials teams will allow for assessment of the potential for chemical spills to impact groundwater sites. AVRWC has established protocols for staff in their "Emergency Response Plan."

#### 4.5 Water Quality Impacts on Reliability

The quality of water dictates numerous management strategies a water purveyor will implement, including, but not limited to, the selection of raw water sources, treatment alternatives, blending options, and modifications to existing treatment facilities. Maintaining and utilizing high quality sources of water simplifies management strategies by increasing water supply alternatives, water supply reliability, and decreasing the cost of treatment. The source water supplies are of good quality for AVRWC. Maintaining high quality source water allows for efficient management of water resources by minimizing costs.

Currently, water quality does not affect water supply reliability in the AVRWC service area. Therefore, no anticipated change in reliability or supply due to water quality is anticipated based on the present data, as is shown in Table 4-1.

**TABLE 4-1  
CURRENT AND PROJECTED WATER SUPPLY CHANGES DUE TO  
WATER QUALITY PERCENTAGE CHANGE**

<b>Water Source</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
Groundwater	0%	0%	0%	0%	0%	0%
Imported	0%	0%	0%	0%	0%	0%

## Section 5: Reliability Planning

---

### 5.1 Overview

The Act requires urban water suppliers to assess water supply reliability that compares total projected water use with the expected water supply over the next twenty-five years in five year increments. The Act also requires an assessment for a single dry year and multiple dry years. This chapter presents the reliability assessment for the Apple Valley Ranchos Water Company (AVRWC) service area.

As stated on AVRWC's website, AVRWC understands the importance of ensuring a safe and reliable water supply for the residents and businesses in its community. This UWMP helps AVRWC to achieve this goal of providing its customers safe and reliable water even during dry periods based on a conservative water supply and demand assumptions over the next 25 years, as discussed in the following sections.

### 5.2 Reliability of Water Supplies

Each water supply source has its own reliability characteristics. In any given year, the variability in weather patterns around the state may affect the availability of supplies to the AVRWC's service area differently. For example, from 2000 through 2002, southern California experienced dry conditions in all three years. During the same period, northern California experienced one dry year and two average years. Typically for water management in southern California local groundwater supplies are used to a greater extent when imported supplies are less available due to dry conditions in the north, and larger amounts of imported water supplies are used during periods when northern California has wetter conditions. This pattern of "conjunctive use" has been in effect since State Water Project (SWP) supplies first came to the Apple Valley area in 1978. SWP supplies have supplemented the overall supply of the AVRWC service area, which previously depended solely on local groundwater supplies.

Per the Mojave Basin Area Judgment, AVRWC has been assigned Base Annual Production (BAP) rights of 13,330 AFY, as summarized in Table 3-3. Also, the Mojave Water Agency (MWA), the Watermaster for the Judgment, has contracted with the California Department of Water Resources (DWR) for delivery of SWP water, providing an imported water supply for recharging the Mojave River Groundwater Basin. While the variability in SWP supplies affects the ability of MWA to meet the overall water supply needs for the service area; for AVRWC, the added SWP supply is recharged into the groundwater basin in wet and dry years, thus providing needed stability to the adjudicated groundwater basin.

As discussed in Section 3.2 of this Plan, each SWP contractor's Water Supply Contract contains a Table A amount that identifies the maximum amount of water that contractor may request. However, the amount of SWP water actually allocated to contractors each year is dependent on a number of factors that can vary significantly from year to year. The primary factors affecting SWP supply availability include hydrologic conditions in northern California, the amount of water in SWP storage reservoirs at the beginning of the year, regulatory and operational constraints, and the total amount of water requested by the contractors. The availability of SWP supplies to

MWA and the other SWP contractors is generally less than their full Table A amounts in many years and can be significantly less in very dry years.

### 5.3 Average, Single-Dry, and Multiple-Dry Year Planning

Currently, AVRWC has one source of water supply – groundwater from the adjudicated Mojave River Groundwater Basin. This supply is available to meet demands during average, single-dry, and multiple-dry years. The following sections elaborate on the supply available to AVRWC during each of the various dry year conditions and what supplies can be expected. Each subsection will explain the criteria used for estimating single-dry and multiple dry supplies that are then used in the comparison tables in Section 5.4.

#### 5.3.1 Local Supplies

The AVRWC local water supply includes only groundwater from the Mojave River Groundwater Basin. The following subsections discuss how the estimates for this local supply source were derived for average, single-dry and multiple-dry year periods.

In both dry year conditions (single-dry year and multiple-dry years), the groundwater supply is assumed to remain 100 percent available because the long-term average of the groundwater basin includes dry periods, and any single or multiple-year dry cycle does not impact the long-term yield of the basin.

### 5.4 Supply and Demand Comparisons

The available supplies and water demands for AVRWC's service area were analyzed to assess the service area's ability to satisfy demands during three scenarios: an average water year, single-dry year, and multiple-dry years. The tables in this section present the supplies and demands for the various drought scenarios for the projected planning period of 2010-2035 in five year increments. Table 5-1 presents the base years for the development of water year data. Tables 5-2, 5-3, and 5-4 at the end of this section summarize, respectively, Average Water Year, Single-Dry Water Year, and Multiple-Dry Year supplies.

**TABLE 5-1  
BASIS OF WATER YEAR DATA**

<b>Water Year Type</b>	<b>Base Years</b>	<b>Historical Sequence</b>
Average Water Year	Average	1922-2003
Single-Dry Water Year	1977	--
Multiple-Dry Water Years	1931-1934	--

#### 5.4.1 Average/Normal Water Year

Table 5-2 summarizes AVRWC's water supplies available to meet demands over the 25-year planning period during an average/normal year. As presented in the table, AVRWC's water supply is broken down into existing and planned water supply sources. Demands are shown with the effects of an assumed urban demand reduction (conservation) resulting from SBX7-7 imposed reductions.

#### 5.4.2 Single-Dry Year

The water supplies and demands for AVRWC's service area over the 25-year planning period were analyzed in the event that a single-dry year occurs, similar to the drought that occurred in California in 1977. Table 5-3 summarizes the existing and planned supplies available to meet demands during a single-dry year. Demand during dry years was assumed to increase by 10 percent due to increased irrigation needs.

#### 5.4.3 Multiple-Dry Year

The water supplies and demands for AVRWC's service area over the 25-year planning period were analyzed in the event that a four-year multiple-dry year event occurs, similar to the drought that occurred during the years 1931 to 1934. Table 5-4 summarizes the existing and planned supplies available to meet demands during multiple-dry years. Demand during dry years was assumed to increase by 10 percent.

#### 5.4.4 Summary of Comparisons

As shown in the analyses above, AVRWC has adequate supplies to meet demands during average, single-dry, and multiple-dry years throughout the 25-year planning period.

**TABLE 5-2  
PROJECTED AVERAGE/NORMAL YEAR SUPPLIES AND DEMAND (AFY)**

<b>Water Supply Source</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
<i>Existing Supplies</i>						
<i>Local Supplies<sup>(a)</sup></i>						
Groundwater	14,390 <sup>(b)</sup>	16,547	18,034	19,844	21,652	23,462
<b>Total Existing Supplies</b>	<b>14,390</b>	<b>16,547</b>	<b>18,034</b>	<b>19,844</b>	<b>21,652</b>	<b>23,462</b>
<i>Planned Supplies<sup>(a)</sup></i>						
Potable Water Projects	0	0	0	0	0	0
<b>Total Supplies</b>	<b>14,390</b>	<b>16,547</b>	<b>18,034</b>	<b>19,844</b>	<b>21,652</b>	<b>23,462</b>
<b>Total Adjusted Demand<sup>(c)</sup></b>	<b>14,390</b>	<b>16,547</b>	<b>18,034</b>	<b>19,844</b>	<b>21,652</b>	<b>23,462</b>

Notes:

(a) Taken from Chapter 3 Water Resources, Table 3-1.

(b) Amount is verified actual for 2010.

(c) Conservation is assumed in demands using SBX7-7. See Chapter 2 Water Use, Table 2-7.

**TABLE 5-3  
PROJECTED SINGLE-DRY YEAR SUPPLIES AND DEMAND (AFY)**

<b>Water Supply Source</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
<i>Existing Supplies</i>						
Local Supplies <sup>(a)</sup>						
Groundwater	15,829 <sup>(b)</sup>	18,202	19,837	21,828	23,817	25,808
<b>Total Existing Supplies</b>	<b>15,829</b>	<b>18,202</b>	<b>19,837</b>	<b>21,828</b>	<b>23,817</b>	<b>25,808</b>
<i>Planned Supplies<sup>(a)</sup></i>						
Potable Water Projects	0	0	0	0	0	0
<b>Total Supplies</b>	<b>15,829</b>	<b>18,202</b>	<b>19,837</b>	<b>21,828</b>	<b>23,817</b>	<b>25,808</b>
<b>Total Adjusted Demand<sup>(c)</sup></b>	<b>15,829</b>	<b>18,202</b>	<b>19,837</b>	<b>21,828</b>	<b>23,817</b>	<b>25,808</b>

**Notes:**

- (a) Taken from Chapter 3 Water Resources, Table 3-1.  
 (b) Amount is 110% times the verified actual amount for 2010.  
 (c) Conservation is assumed in demands using SBX7-7. See Chapter 2 Water Use, Table 2-7. Also assumes increase in total demand of 10 percent during dry years.

**TABLE 5-4  
PROJECTED MULTIPLE-DRY YEAR SUPPLIES AND DEMAND (AFY)**

<b>Water Supply Source<sup>(a)</sup></b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
<i>Existing Supplies</i>						
Local Supplies <sup>(b)</sup>						
Groundwater	15,829 <sup>(c)</sup>	18,202	19,837	21,828	23,817	25,808
<b>Total Existing Supplies</b>	<b>15,829</b>	<b>18,202</b>	<b>19,837</b>	<b>21,828</b>	<b>23,817</b>	<b>25,808</b>
<i>Planned Supplies<sup>(b)</sup></i>						
Potable Water Projects	0	0	0	0	0	0
<b>Total Supplies</b>	<b>15,829</b>	<b>18,202</b>	<b>19,837</b>	<b>21,828</b>	<b>23,817</b>	<b>25,808</b>
<b>Total Adjusted Demand<sup>(d)</sup></b>	<b>15,829</b>	<b>18,202</b>	<b>19,837</b>	<b>21,828</b>	<b>23,817</b>	<b>25,808</b>

**Notes:**

- (a) Supplies shown are annual averages over four consecutive dry years (unless otherwise noted).  
 (b) Taken from Chapter 3 Water Resources, Table 3-1.  
 (c) Amount is 110% times the verified actual amount for 2010.  
 (d) Conservation is assumed in demands using SBX7-7. See Chapter 2 Water Use, Table 2-7. Also assumes increase in total demand of 10 percent during dry years.



## Section 6: Demand Management Measures

---

This section describes the water Demand Management Measures (DMMs) implemented by AVRWC as a part of the effort to reduce water demand.

### 6.1 Background

AVRWC recognizes that conserving water is an integral component of a responsible water strategy and is committed to providing education, tools and incentives to help its customers reduce the amount of water they use. In 2011, AVRWC prepared a 5-year Water Use Efficiency Business Plan (WUE Plan) to:

- Create the strategy and blueprint to meet per capita water demand reduction goals, and
- Deliver the customized tools required to track performance while maintaining flexibility to adjust to future conditions and changes.

The WUE Plan provides a detailed study of existing residential and commercial, industrial, institutional (CII) water use, and recommends programs designed to meet both SBX7-7 and Programmatic DMM requirements.

### 6.2 AVRWC and the Demand Management Measures

AVRWC is subject to the Urban Water Management Planning Act, AB 1420 and SBX7-7 requirements, in addition to the commitment of compliance with the Best Management Practices (BMPs) as a signatory to the Memorandum of Understanding Regarding Water Conservation in California (MOU).

In June 2009, AVRWC became a signatory to the MOU and a member of the California Urban Water Conservation Council (CUWCC), establishing a firm commitment to the implementation of the BMPs or DMMs. The CUWCC is a consensus-based partnership of agencies and organizations concerned with water supply and conservation of natural resources in California. By becoming a signatory, AVRWC committed to implement a specific set of locally cost-effective conservation practices in its service area.

The MOU and BMPs were revised by the CUWCC in 2008. The revised BMPs now contain a category of “Foundational BMPs” that signatories are expected to implement as a matter of their regular course of business. These include Utility Operations (metering, water loss control, pricing, conservation coordinator, wholesale agency assistance programs and water waste ordinances) and Public Education (public outreach and school education programs). The remaining “Programmatic” BMPs have been placed into three categories: Residential, Large Landscape, and CII Programs and are similar to the original quantifiable BMPs. These revisions are reflected in the CUWCC reporting database starting with reporting year 2009 and the 2010 UWMP’s DMM compliance requirements. The new category of foundational BMPs is a significant shift in the revised MOU.

A key intent of the recent MOU revision was to provide retail water agencies with more flexibility in meeting requirements and allow them to choose program options most suitable to their

specific needs. Therefore, as alternatives to the traditional Programmatic BMP requirements, agencies may also implement the MOU Flex Track or gallons per capita per day (gpcd) options.

Under the Flex Track option, an agency is responsible for achieving water savings greater than or equal to those it would have achieved using only the BMP list items. The CUWCC has developed three Flex Track Menus — Residential, CII, and Landscape — and each provides a list of program options that may be implemented in part or any combination to meet the water savings goal of that BMP. Custom measures can also be developed and require documentation on how savings were realized and the method and calculations for estimating savings.

The gpcd option sets a water use reduction goal of 18 percent reduction by 2018. The MOU defines the variables involved in setting the baseline and determining final and interim targets. The gpcd option and requirements track well with the requirements of SBX7-7. AVRWC has chosen to implement the gpcd compliance option.

Signatories to the urban MOU are allowed by Water Code Section 10631(j) to include their biennial CUWCC BMP reports in an UWMP to meet the requirements of the DMM sections of the UWMP Act. AVRWC has chosen to comply with the requirements of the Act by providing the information required by the DMMs in this section of the Plan instead of attaching the 2009 and 2010 BMP Reports.

The following sections provide more detail on AVRWC's conservation programs and compliance with the BMPs.

## **6.2.1 Foundational BMPs**

### **6.2.1.1 Utility Operations**

#### **6.2.1.1.1 Conservation Coordinator**

AVRWC has had a full-time conservation coordinator since 2008.

#### **6.2.1.1.2 Water Waste Prohibition**

AVRWC operates under CPUC-approved rules that include Rule No. 14.1, the Water Conservation and Rationing Plan, and Rule 11, Discontinuance and Restoration of Service.

Rule 11, Discontinuance and Restoration of Service, allows the company to restrict and/or disconnect water service for customers using water in a wasteful manner.

The PUC's methodology for water utilities to implement water conservation plans is documented in Standard Practice U-40-W, "Instructions for Water Conservation, Rationing, and Service Connection Moratoria." Water shortage contingency plans must be approved by the PUC prior to implementation by AVRWC. As stated in the Standard Practice U-40-W, the PUC shall authorize mandatory conservation and rationing by approving Rule No. 14.1, Mandatory Water Conservation and Rationing. Rule No. 14.1 sets forth water use violation fines, charges for removal of flow restrictors, and the period during which mandatory conservation and rationing measures will be in effect. Additionally, the Town of Apple Valley's Municipal Code Chapter 6.40 establishes a water waste ordinance within AVRWC's service area (Appendix E).

AVRWC also informs customers of leaks that would create a shutdown or out of water situation and has a leak repair program that is reported to the CDPH on an annual basis.

#### **6.2.1.1.3 Water Loss Control**

Accountability and efficient operations are a priority at AVRWC. Leak detection activities are an ongoing operation and in 2009 AVRWC decided to elevate that process and participate in Southern California Edison's (SCE's) Water Leak / Leak Detection and Water System Loss Control Study. AVRWC hired a water loss consultant to perform a system assessment based on AWWA's District Meter Area (DMA) methodology. The study provided the following:

- Detailed top down water audit and economic level of leakage analysis, and
- Leakage field measurements through establishment of DMAs and proactive leakage intervention through leak detection and repair and pressure management.

The Water Audit utilized the new International Water Association/American Water Works Association (IWA/AWWA) standardized Water Balance methodology to disaggregate and validate components of system input Volume, consumption volume, apparent loss volume and real loss volume to identify the potential for reducing water loss. The resulting water balance is shown in Figure 6-1. The water balance was based on 2007 use; AVRWC will be performing the 2010 balance in 2011.

A DMA is a hydraulically discrete part of the distribution network that is isolated from the rest of the distribution system. It is normally supplied through a single metered pipeline so that the total inflow to the area can be measured. AVRWC performed extensive leak assessment of two DMAs in their service area: Del Oro and Riverside.

The Del Oro DMA is located in the west of AVRWC's distribution network. Del Oro was temporarily isolated from the rest of the distribution network by closing all boundary valves creating a hydraulically discrete area with only one intertie to the adjacent system in the west. The intertie was equipped with a 2 inch tap to install an insertion flow meter to monitor the supply into the DMA. All boundary valves were closed and verified and all 261 customer service connections were shut-off so that any volume metered by the insertion flow meter would be due to running leaks in the DMA. As soon as all service connections were shut-off, the flow into the DMA was reduced to zero. An artificial demand was created inside the DMA by opening up a hose bib in order to verify that the insertion meter was working correctly. The artificial flow was picked up by the insertion meter once flow rates approached about 8 gallons per minute (gpm). This test demonstrated that the Del Oro DMA does not have any discernable leakage losses that would justify any leak detection efforts.

**FIGURE 6-1  
AVRWC WATER BALANCE**

Water Audit: Calendar Year 2007					<a href="#">Main Menu</a>
<b>WATER AUDIT RESULTS</b>					
<b>System Input Volume</b>  5,581 MG (100%)	<b>Authorized Consumption</b>  5,143 MG (92%)	<b>Billed Authorized</b>  5,117 MG (92%)	<b>Billed Metered Water Exported</b>  - MG (0%)	<b>Revenue Water</b>  5,117 MG (92%)	
			<b>Billed Metered Authorized</b>  5,117 MG (92%)		
			<b>Billed Un-metered Authorized</b>  - MG (0%)		
		<b>Un-billed Authorized</b>  27 MG (0%)	<b>Un-billed Metered Authorized</b>  13 MG (0%)	<b>Non-Revenue Water</b>  464 MG (8%)	
	<b>Water Losses</b>  438 MG (8%)	<b>Apparent Losses</b>  93 MG (2%)	<b>Un-billed Un-metered Authorized</b>  13 MG (0%)		
			<b>Unauthorized Consumption</b>  - MG (0%)		
		<b>Real Losses</b>  345 MG (6%)	<b>Meter Error</b>  93 MG (2%)		

(Amounts are total volumes for the 365 day audit period from 1/1/2007 to 12/31/2007 inclusive)

AVRWC performed a similar assessment, including a pressure management trial, on the Riverside DMA, also located on the west side of AVRWC's distribution network. The analysis was based on calculation of real losses from minimum night-time flow. Minimum Night-time Flow (MNF) analysis uses field test data to quantify the volume of real loss (leakage) within the distribution network. During the MNF period, authorized consumption is at a minimum, and therefore leakage is at its maximum percentage of the total demand in the DMA. The results can be directly compared with the volume of real loss obtained from the top-down water balance. Sensitivity analysis was carried out with the MNF data and the Minimum Night-time consumption data indicating that the volume of leakage in the Riverside DMA is probably not significant enough to warrant proactive leak detection. The consultant also assessed the benefits of pressure reduction on leakage losses and reductions in customer demand (pressure sensitive demand such as irrigation, faucets and showerheads). Results indicated that pressure reduction had an impact on the leakage volumes (which are assumed to be generally small).

The Water Audit yielded an Infrastructure Leakage Index (ILI) of 1.8 which indicates appropriate loss control. The results of the Water Audit undertaken for the calendar year also indicate that:

- The system input meters are managed very well.
- The billing data is in good condition.
- The percentage volume of Non-Revenue Water (NRW) is low when compared to other water utilities in California.
- The overall accuracy of the small meter population is within industry average.
- AVRWC is successfully managing the apparent losses from the large meter population by regularly testing samples of large meters.
- AVRWC is very effective and quick in responding to reported leaks. Reported leaks are repaired on average in less than a day, a performance which is among the best in North America.
- The system-wide volume of real losses is low and about one-third of these are hidden losses or leaks waiting to be detected and repaired. The rest of the real losses consist of losses from leaks that have been repaired by AVRWC during the audit period and background leakage (leaks too small to be detected).

AVRWC will continue its water loss practices and review the audit recommendations.

#### **6.2.1.1.4 Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections**

All of AVRWC's existing customers are metered and billed volumetrically, as are all new connections. AVRWC is about 80 percent through the process of transitioning all of its meters to an Automatic Meter Reader (AMR) system which, among other things, support customers' conservation efforts.

#### **6.2.1.1.5 Retail Conservation Pricing**

AVRWC's customers are billed bimonthly with tiered rates (Table 6-1).

**TABLE 6-1  
TIERED WATER RATES**

<b>Tier</b>	<b>Consumption Range (in units = 748 gal)</b>	<b>Rate per 100 cubic feet</b>
Tier 1	1-28	\$2.157
Tier 2	29-58	\$2.277
Tier 3	Over 58	\$2.397

In 2010 the portion of the revenue from volumetric rates was 69 percent (Table 6-2). AVRWC expects to be in compliance with the 70 percent requirement in 2011.

**TABLE 6-2  
2006-2010 WATER REVENUE**

<b>Year</b>	<b>Volumetric Revenue</b>	<b>Total Revenue</b>	<b>Percent Volumetric</b>
2006	\$ 10,627,342.00	\$ 16,657,513.00	64%
2007	\$ 11,101,623.00	\$ 17,393,589.00	64%
2008	\$ 10,145,184.00	\$ 16,503,260.00	61%
2009	\$ 12,700,651.00	\$ 18,641,308.00	68%
2010	\$ 13,494,455.00	\$ 19,588,864.00	69%

#### **6.2.1.2 Education**

AVRWC offers education and outreach programs directly to its customers as well as in conjunction with its wholesaler (Mojave Water Agency) and the Alliance for Water Awareness and Conservation (AWAC).

AWAC is a dynamic coalition of 25 regional organizations, including AVRWC, whose mission is to promote the efficient use of water and increase communities' awareness of conservation as an important tool to help ensure an adequate water supply. AWAC was formed in 2003 in response to growing water demand throughout a 4,900-square-mile area of the Mojave Desert in Southern California.

According to the enabling MOU, the purpose of the AWAC is to “provide a vehicle to attract support for a regional water conservation program and coordinate implementation of activities by forming partnerships to obtain common, measurable goals.” AWAC set three goals that aim to change water-use habits and empower High Desert communities with the tools to ensure adequate supplies of water for future generations:

- 1) Educate the local communities with the understanding of the importance of water conservation;
- 2) Provide the local communities with the tools to effectively reduce per capita consumption to targeted goals; and,
- 3) Reduce regional water use by 10 percent gross per capita by 2010 and 20 percent gross per capita by 2020 (5 percent in the Morongo Basin by 2015) to achieve a sustainable, reliable supply to meet regional water demands.

AWAC works to help all of its customers use water more efficiently, including: new and existing homeowners; landscape suppliers; professional and commercial landscapers; developers; commercial, industrial, and institutional entities; and, retail water providers and cities.

AVRWC is committed to supporting outreach and education programs; Table 6-3 details the projected budget for these programs through 2014. Prior to 2011, the budget was not allocated to specific categories such as outreach and education.

**TABLE 6-3  
PROJECTED BUDGET FOR PUBLIC INFORMATION AND EDUCATION PROGRAMS**

	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
Budget	\$23,200	\$23,900	\$24,600	\$25,350

### 6.2.1.2.1 Public Information

AVRWC provides informational materials to customers through bill inserts, newsletters, a website, and other events. In addition, AWAC offers its member agencies speakers for community groups, water smart landscaping information, water saving tips and a plant of the month program. AWAC also sponsors water conservation and water-smart landscaping workshops for landscape professionals. Attendance at the workshop qualifies the participant for continuing education credits.

The public information program is ongoing and dynamic and meets quarterly contact requirements. Table 6-4 provides a description of the education and outreach programs currently or recently offered by AVRWC.

**TABLE 6-4  
EDUCATION AND OUTREACH PROGRAMS**

<b>Program</b>	<b>Description</b>
Alliance for Water Awareness and Conservation Educational Programs	As a member of AWAC, AVRWC has access to speakers, public education materials, water awareness workshops, irrigation workshops and educational resources. In 2009, 4 irrigation workshops were given. In 2010, 7 workshops were offered including irrigation, water awareness, and training to landscapers and other industry customers.
AVRWC Community Education Program	School and event speaker program to provide water conservation presentations at public events
	School assemblies and class presentations on how water reaches the home and what students can do to conserve water. Each child is given a bag of giveaways including coloring books, wristbands, tattoos, stickers, water drop sponges, water audit kits, and 5-minute shower timers. Fifty students attended the presentation, Grades 2 through 5. 660 students attended the assembly, Grades k through 5.
Apple Valley Head Start Education and Coloring Contest	AVRWC also conducts a coloring contest for students offering gift cards and trophies for the students that best demonstrate how to conserve water. 200 students participated.
Product Giveaways	Distribution of free indoor conservation kits, including showerheads, aerators and leak detection kits.

### 6.2.1.2.2 School Education

AVRWC provides in-classroom visits and a community and school speaker program. An AVRWC staff member attends special assemblies or class presentation opportunities to present water conservation information and collateral materials. In 2009, over 1,000 students in the AVRWC service area attended age-specific water conservation presentations. Additionally, an elementary school art contest was sponsored by AVRWC, and water conservation collateral materials were distributed to all participating students. Educational materials meet the state education framework requirements. These programs are in addition to those implemented in collaboration with AWAC (Table 6-4). The education program budget is combined with the public outreach programs (Table 6-3).

## 6.2.2 Programmatic BMPs

AVRWC is pursuing a gpdc approach to complying with the Programmatic BMPs. The DMM gpdc goals, shown in Table 6-5, are determined as follows:

- 1) Baseline GPCD = average annual Potable Water GPCD for the years 1997 through 2006.
- 2) 2018 GPCD Target = Baseline GPCD multiplied by 0.82 (an 18% reduction).
- 3) Biennial GPCD Targets = Baseline GPCD multiplied by that year's Target (% Baseline).  
A retail water agency may choose a starting point as either its Baseline GPCD or its 2006 Potable Water GPCD.

**TABLE 6-5  
DMM GPCD TARGET CALCULATION**

<b>Year</b>	<b>Use (gpcd)</b>
1997	348
1998	301
1999	325
2000	307
2001	277
2002	285
2003	264
2004	260
2005	233
2006	243
<b>Baseline</b>	<b>284</b>
<b>Target (2018)</b>	<b>233</b>

Compliance is evaluated in relation to Table 6-6 and relative progress toward the goal will be acknowledged in the CUWCC's Compliance Reports. The compliance tables are read as five increments with reporting goals relative to the first through fifth Compliance reports.

**TABLE 6-6  
ANNUAL DMM COMPLIANCE TARGETS (IN GPCD)**

<b>Year</b>	<b>Compliance Report</b>	<b>Target</b>	<b>Highest Acceptable Bound</b>
2010	1	267	284
2012	2	264	274
2014	3	254	264
2016	4	243	254
2018	5	233	233

Though the DMM goals exceed the SBX7-7 requirements, AVRWC's UWMP Plan achieves both (the SBX7-7 baseline and target calculations are addressed in Chapter 2). The Plan builds on existing activities and focuses on both regional and local actions combining:

- 1) **Water Use Efficiency (WUE) Active Programs**—offering customers a portfolio of water efficiency measures, and
- 2) **WUE Passive Policy Initiatives**—building codes and landscape ordinances.



Table 6-7 shows the anticipated reductions in use from the WUE activities.

**TABLE 6-7  
IMPACT OF WUE ACTIVITIES**

	YEAR		
	2015	2018	2020
SBX7-7 GPCD Target	275		245
DMM GPCD Target		233	
Projected GPCD reduction from WUE Activities Planned for 2010-2015	29		65
Projected GPCD Use (Using the average 2007-2009 GPCD demand of 239 gallons as a starting point)	210		174
Projected GPCD Achievement (percentage reduction from 1995-2004 Base)	24%		29%

Although AVRWC's 2010 use of 205 gpcd meets both the SBX7-7 and DMM goals, it recognizes that recent reductions, starting in 2007, have been dramatic at about 25 percent and that there is no firm assurance that this reduction will be maintained. The recent downturn in the economy, drought messaging and the unseasonably cool weather are all conditions that are variable and can drastically fluctuate. AVRWC, therefore, developed a five year action plan to help maintain these reductions; the WUE Plan will be reevaluated after that in coordination with the UWMP schedule.

In addition to the Foundational DMMs being implemented, in order to achieve the WUE active programs' goal, AVRWC will implement four active, quantifiable programs. The programs will deliver water savings through the 2015, 2018 and 2020 target years and beyond due to the long life for several of the measures being offered. The WUE Plan is estimated to save 7,306 acre-feet of water over the life of the measures. By comparison the DMM Target goal of 233 gpcd requires a reduction of about 420 AFY or 3,400 AF by 2018 (from average of 2007-2009 use).

### 6.2.3 Selected Programs

Following a detailed cost-effectiveness and savings potential analysis AVRWC prioritized a comprehensive list of program opportunities. AVRWC utilized the Alliance for Water Efficiency (AWE) Tracking Tool to conduct its analysis as well as for future program tracking. The Tracking Tool is a widely recognized Excel-based model that can provide in-depth evaluation of program water savings and costs and benefits of conservation programs over time. The program was developed by the AWE, a stakeholder-based non-profit organization dedicated to the efficient and sustainable use of water.

The programs chosen for implementation reflect a heavy emphasis on landscape programs because it was estimated that in 2008, almost 74 percent of the total water demand was for landscape irrigation. AVRWC selected the following five programs for implementation:

- 1) High Efficiency Nozzle Distribution
- 2) Turf Replacement – Although turf replacement delivers extremely high water savings in most retrofit projects, it is not yet deemed cost-effective for AVRWC to fund a turf

replacement incentive program on their own. At this time, AVRWC will leverage the Mojave Water Agency program as funds are available.

- 3) Landscape Evaluation Surveys
- 4) Multi-Family HET Direct Installation Program
- 5) Education and Outreach programs

Table 6-8 provides an overview of the lifetime water savings for each of the programs.

**TABLE 6-8  
LIFETIME WATER SAVINGS BY WUE ACTIVE PROGRAMS**

<b>WUE Active Program</b>	<b>Estimated Lifetime Water Savings (AF)</b>
HOA and Large Landscape High Efficiency Nozzle Distribution Program	600
Cash for Grass Turf Replacement Incentive Program	4,797
Single Family Landscape Survey and Nozzle Distribution Program	400
Multi-family HET Direct Installation Program	1,509
<b>Total</b>	<b>7,306</b>

#### **6.2.3.1 Economic Impacts / Costs**

The estimated annual cost for program implementation is \$107,000.

#### **6.2.3.2 Implementation Schedule**

Program planning is a fluid process. On a regular and ongoing cycle, program plans and schedules will need to be revised and updated. At this time, all programs are anticipated to be initiated in 2011. Implementation details for each quantifiable program including: program descriptions, measures offered, target customer segments, marketing methods, delivery mechanisms, production numbers, program costs and economic evaluation results are in Table 6-9.

**TABLE 6-9  
PROJECTED NUMBER OF ACTIVITIES IMPLEMENTED PER YEAR**

<b>Activity Name</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>5 Year Total</b>
HOA and Large Landscape HE Nozzle Distribution	6,000	6,000	6,000	6,000	6,000	30,000
SF Landscape Survey and Nozzle Distribution	160	160	160	160	160	800
MF HE Toilet Direct Installation	280	280	280	280	280	1,400
MWA SF Turf Replacement Rebate	333	333	333	333	333	1,665

#### **6.2.3.3 Evaluating Effectiveness of the DMMs**

AVRWC will track all program activities including outreach activities, rebate distribution and audits. AVRWC will use the AWE Tracking Tool for future program monitoring. The Tracking Tool provides not only the ability to select water conservation programs for implementation based upon a thorough analysis of the program's anticipated impacts, but also allows for the tracking of future program performance. The model can be adapted and adjusted at any time and impacts re-calculated based upon real world program performance.

#### **6.2.3.4 Impacts of Conservation**

The implementation of the stated conservation programs are expected to assist in further reduction in demand within the system.



## Section 7: Water Storage Contingency Planning

---

### 7.1 Overview

Water supplies may be interrupted or reduced significantly in a number of ways, such as a drought which limits supplies, an earthquake which damages water delivery or storage facilities, a regional power outage, or a toxic spill that affects water quality. This chapter of the Plan describes how Apple Valley Ranchos Water Company (AVRWC) plans to respond to such emergencies so that emergency needs are met promptly and equitably.

AVRWC has developed a four-stage plan for responding to water shortages. AVRWC has adopted Rule 14.1 of the California Public Utilities Commission's (CPUC's) entitled Water Conservation and Rationing Plan (Appendix F) as its *Water Shortage Contingency Plan* (Contingency Plan). It includes voluntary and mandatory stages to address a reduction in water supply that exceeds 50 percent. Prohibitions, penalties and financial impacts of shortages have been developed by AVRWC and the Town of Apple Valley and are summarized in this chapter.

### 7.2 Coordinated Planning

AVRWC has water rights to the adjudicated Mojave River Groundwater Basin (Basin). The Board of Directors of the Mojave Water Agency (MWA) serves as the Watermaster for the Basin and sets the adjudicated Base Annual Production (BAP) and Free Production Allowance (FPA) amounts. The Basin's groundwater supply is replenished by MWA purchasing imported State Water Project (SWP), when available, and recharging it into the Basin. During past shortages, AVRWC has managed to meet all their demands by pumping groundwater only.

The previous droughts have had no significant effect on water supply to the AVRWC area. More efficient use of water was encouraged during the 1976-77 drought. An even greater awareness of water conservation occurred during the 1987-1992 drought and has contributed towards the practice of saving water. The Town of Apple Valley has adopted a Water Conservation Ordinance (Chapter 6.40) that calls for voluntary conservation (see Appendix E). AVRWC's customers have responded to this by reducing water usage by approximately 10 percent. AVRWC employees work closely with the Town of Apple Valley's staff to educate customers on good conservation practices.

### 7.3 Stages of Action to Respond to Water Shortages

If water supplies are projected to be insufficient to meet normal customer demand and are beyond the control of the utility, AVRWC may implement voluntary conservation after notifying the CPUC's Water Division. In the event that voluntary conservation measures are not adequate, AVRWC may impose mandatory conservation and rationing after receiving CPUC approval. AVRWC also works in collaboration with the Town of Apple Valley in which it serves to encourage conservation. AVRWC informs its customers of their local town ordinances, as well as takes the necessary actions available to curtail the waste of water. AVRWC's Contingency Plan covers four stages of action to be taken in response to water supply shortages up to 50 percent. The stages, demand reduction goals, and type of program are listed in Table 7-1.

**TABLE 7-1  
WATER SUPPLY SHORTAGE STAGES AND REDUCTON GOALS**

<b>Stage</b>	<b>Shortage</b>	<b>Demand Reduction Goal</b>	<b>Type of Program</b>
I	Minimum	5-10 Percent	Voluntary
II	Moderate	10-20 Percent	Mandatory Conservation Stage Mandatory Conservation Rules and Increased Tiered Rates
III	Severe	20-35 Percent	Rationing Stage Allotments Mandatory Conservation Rules and Increased Tiered Rates
IV	Critical	35-50 Percent	Critical Rationing Stage Allotments Mandatory Conservation Rules and Increased Tiered Rates

- **Stage 1**  
During Stage 1, the drought conditions will be outlined and communicated to AVRWC's customers. Voluntary conservation will be encouraged.
- **Stage 2**  
AVRWC will continue public outreach and education about the water supply conditions, and customers will be asked to reduce consumption by 10 to 20 percent. Depending on the desired reduction goal, mandatory conservation may be required. Prior to implementation of mandatory restrictions, CPUC approval will be required. Each customer will be notified of the change in tiered rates and other details about the rationing plan by mail before the effective date of the Water Shortage Emergency. New customers would be notified at the time the application for service is made. The voluntary conservation measures listed in Section 7.6 will become mandatory when a rationing program goes into effect. In a disaster, prior notification may not be possible, and notice will be provided by other means. AVRWC will also work with appropriate governmental agencies for the passage of drought ordinances.
- **Stage 3**  
During Stage 3, allotments and mandatory conservation rules will be required to meet reductions of 20 to 35 percent. Rate changes will be implemented to penalize excess usage. If a customer consistently abuses water, a flow restrictor may be installed. AVRWC would monitor production daily for compliance with conservation reduction requirements and may read customer meters on a more frequent basis.
- **Stage 4**  
In Stage 4, the shortage is critical and 35 to 50 percent reduction will be required. The steps taken in the prior stages will be increased, and production will be monitored daily.

During declared water shortages that require rationing, AVRWC will obtain authority from the CPUC to enact additional restrictions based on drought severity.

## 7.4 Minimum Water Supply Available During Next Three Years

The minimum water supply available during the next three years would occur during a three-year multiple-dry year event between the years 2011 and 2013. As shown in Table 7-2, the total minimum supplies are approximately 15,000 acre-feet per year (AFY) during the next three years. When comparing these supplies to the demand projections provided in Chapters 2 and 5 of this Plan, AVRWC has adequate supplies available to meet projected demands should a multiple-dry year period occur during the next three years.

**TABLE 7-2  
ESTIMATE OF MINIMUM SUPPLY FOR THE NEXT THREE YEARS**

Source	Supply (AFY)		
	2011	2012	2013
<i>Existing Supplies</i>			
Local Supply			
Groundwater <sup>(a)</sup>	14,821	15,253	15,684
<b>Total Existing Supplies</b>	<b>14,821</b>	<b>15,253</b>	<b>15,684</b>
<i>Planned Supplies</i>			
New Projects <sup>(a)</sup>	0	0	0
<b>Total Supplies</b>	<b>14,821</b>	<b>15,253</b>	<b>15,684</b>
<b>Total Estimated Demands<sup>(b)</sup></b>	<b>14,821</b>	<b>15,253</b>	<b>15,684</b>

Notes:

(a) See Table 3-1 in Chapter 3, Water Resources.

(b) See Chapter 2 Water Use, Table 2-7. Please note that the demands are the same with and without conservation.

## 7.5 Actions to Prepare for Catastrophic Interruption

### 7.5.1 General

The groundwater basins in the Company's area are the limiting factor in groundwater production, but are expected to continue to produce reliable supplies even in a catastrophe.

AVRWC has implemented actions designed to minimize the impacts of supply interruption caused by catastrophic events within their service area. Catastrophic events include non-drought related events such as earthquakes, regional power outages, and system failures. The AVRWC has an Emergency Response Plan to respond to major emergencies associated with natural disasters, technology incidents, and national security emergencies affecting the facilities and service areas.

AVRWC has an interconnection with Victorville Water District to transfer water and could utilize this to continue delivering water to that system in a localized emergency.

Water stored in the AVRWC's distribution system storage tanks are monitored and managed to not allow the reservoir volumes to drop to very low levels. Standard practice is to maintain, at a minimum, the required emergency and fire flow within all tanks at all times. In an emergency, these stored water volumes are available for distribution or truck delivery as necessary.

### 7.5.2 Regional Power Outage Scenarios

For a major emergency such as an earthquake, Southern California Edison (Edison) has declared that in the event of an outage, power would be restored within a 24 hour period. For example, following the 1994 Northridge earthquake, Edison was able to restore power within 19 hours. Edison experienced extensive damage to several key power stations, yet was still able to recover within a 24-hour timeframe.

To specifically address the concerns of water outages due to loss of power, AVWRC has fifteen (15) backup generators, six of which are located at the priority facility sites and have automatic transfer switches that will start the generator automatically when the power outage occurs. The remaining generators are portable and can be used at any site determined necessary during an outage.

To fuel the generators, AVRWC has diesel storage capacity of 24,000 gallons. Also, there is a carrier truck with capability of dispensing 100 gallons of diesel as necessary in refilling the generators.

## 7.6 Mandatory Prohibitions During Shortages

Nonessential or unauthorized uses will be prohibited during shortage conditions. As discussed in Section 7.3, voluntary compliance will be requested in Stage 1, and mandatory compliance will be necessary in Stages 2 – 4. The nonessential or unauthorized uses included in Tariff Rule No. 14.1 and listed below (which are also included in the Town of Apple Valley's Water Conservation Ordinance):

- Use of water by a customer when AVRWC has notified the customer to repair broken or defective plumbing or sprinkler system and the customer failed to make such repairs within 5 days after receiving the written notice.
- Use of water which results in flooding or runoff into gutters, waterways, patios, driveways, or streets.  
Use of water for washing aircraft, cars, busses, boats, trailers or other vehicles without a positive automatic shut-off valve on the outlet of the hose.
- Use of water through a hose for washing buildings, structures, walkways, driveways, sidewalks, patios, parking lots, tennis courts, and other hard-surfaced areas which results in excessive run-off or waste.
- Use of water for watering streets with trucks, except for initial wash-down for construction purposed or to protect the health and safety of the public.
- Use of water to clean, fill, or maintain water in non-recycling decorative fountains, decorate lakes or ponds.
- Use of water for construction purposes, such as consolidation of backfill, unless no other source of water or other method can be used.
- Use of water for more than minimal landscaping with any new construction.
- Use of water for watering outside plants and turf areas using a hand-held hose without a positive shut-off valve.



- Use of water for the filling or refilling of swimming pools.
- Service of water by any restaurant except upon request of a patron.
- Use of water from fire hydrants shall be limited to fire fighting and related activities and other uses shall be limited to activities necessary to maintain the public health, safety, and welfare.

## 7.7 Consumptive Reduction Methods During Restrictions

### 7.7.1 Supply Shortage Triggering Levels

AVRWC will manage water supplies to minimize the social and economic impact of water shortages. AVRWC's Contingency Plan is designed to provide a minimum 50 percent of normal supply during a severe or extended water shortage.

Demand reduction stages may be triggered by a shortage of water due to a natural disaster or other catastrophe. The guidelines for triggering the stages are listed in Table 7-3. However, circumstances may arise where AVRWC may deviate from these guidelines, such as in a case where the Governor declares a water shortage emergency and/or institutes a statewide rationing program.

**TABLE 7-3  
WATER REDUCTION TRIGGERING LEVELS**

Stage	Percent Reduction Targets
1	5-10%
2	10-20%
3	20-35%
4	35-50%

Source: AVRWC 2005 UWMP.

### 7.7.2 Consumption Limits

To reduce water use during the most severe stages of shortage, the following methods may be employed, in addition to the restrictions listed in Section 7.6:

- Education programs
- Water conservation kits
- Flow restrictions
- Restrict use for only priority uses
- Percentage reduction by customer type
- Increasing tiers and tiered rates
- Plumbing fixture replacement
- Excess use penalty
- Termination of service

### 7.7.3 New Demand

During a Stage 3 water shortage emergency, issuance of construction water meters would cease and meters would only be installed for new accounts where the building permit was issued prior to the declaration of the water shortage. No meters will be installed for new accounts during a Stage 4 water shortage emergency.

## 7.8 Penalties for Excessive Use

Apple Valley Ranchos Water Company will obtain approval from the CPUC prior to implementing an excess use penalty per 100 cubic feet of water used in excess of the applicable allocation during each billing period, and shall be charged by the Company for all services rendered. The AVRWC may, after one written warning, install a flow-restricting device on the service line of any customer observed by AVRWC personnel to be using water for any nonessential or unauthorized water use. If, despite installation of flow-restricting device, nonessential or unauthorized water use continues, the AVRWC may discontinue water service to such customer.

### 7.8.1 Appeal Procedure

Any customer may seek a variance from any of the provisions of the water rationing plan by notifying the AVRWC in writing, setting forth the grounds for a variance in detail. Any customer not satisfied with the AVRWC's response may file an appeal with the CPUC.

## 7.9 Revenue and Expenditure Impacts and Measures to Overcome Those Impacts

In 2008, the CPUC approved the establishment of a Water Revenue Adjustment Mechanism (WRAM) Balancing Account and a Modified Cost Balancing Account (MCBA). These two regulatory accounts track the difference between actual and adopted water sales and production costs as part of a water conservation program. By March 31st of each year, AVRWC provides the CPUC Division of Water and Audit a written report on the status of the WRAM and MCBA. The report includes a section on the net accumulated balance as of December 31st of the preceding calendar year. If the combined net accumulated balance for the WRAM and MCBA exceeds 2.0 percent of the total recorded revenue requirement for the prior calendar year, AVRWC will file an advice letter within 30 days that amortizes the balance of both accounts. Recovery of the under-collections and refunds of over collections will be passed on to ratepayers through volumetric surcharges and surcredits.

## 7.10 Water Shortage Contingency Ordinance

As a private water utility, AVRWC does not have the authority from the CPUC to adopt any ordinances for excessive use. However, AVRWC works closely with city governments in which it serves to encourage conservation and institute ordinances as necessary. AVRWC works diligently in collaboration with MWA, the Town of Apple Valley and the County of San Bernardino in which it serves to carry out the declared water shortage stages.

### 7.11 Mechanism to Determine Reductions in Water Use

In normal water supply conditions, production figures are recorded monthly and are incorporated into the monthly water production report. During rationing conditions, water shortages will be monitored on a weekly, daily, or hourly basis depending on the severity of the drought. Well production can be retrieved on an hourly basis. This allows AVRWC Production Department to determine the effects of reductions on water production within the system.

During a disaster shortage, production figures will be monitored on an ongoing basis. AVRWC's SCADA system will warn of any critical conditions instantly. Reports will be provided on a daily basis to AVRWC management.



## References

---

Assembly Committee on Local Government, 2002. Assembly Bill 3030. California State Assembly, Sacramento, CA.

Assembly Bill 1420. 2007. California State Assembly, Sacramento, CA.

Apple Valley Ranchos Water Company (AVRWC), 2005. *2005 Urban Water Management Plan*. Apple Valley, CA. November.

AVRWC, 2009. *Technical Report Analysis of Source and Storage Capacity 2009 Update*. Prepared by Park Water Company. June.

AVRWC, 2011. Water Use Efficiency Business Plan 2011-2015. Apple Valley, CA. May.

Bookman-Edmonston Engineering, Inc., 1994. *Mojave Water Agency Regional Water Management Plan*. Bookman-Edmonston Engineering, Inc., Glendale, CA.

California State Senate, 2006. Senate Bill 1087.

California State Senate, 2010. Senate Bill 7 of Special Extended Session 7 (SBX7-7) (Steinberg).

California Water Code, Section 375.

California Water Code, Section 1211.

California Water Code, Sections 1810-1814 ("KATZ Law").

California Water Code, Section 10617.

California Water Code, Section 10631.

California Water Code, Section 10750-10753.10.

California Water Code, Section 13750.5.

California State Senate, 2002. Senate Bill 1938.

CalFed, 2007. 2007 CalFed Annual Report. CalFed Bay-Delta Program, Sacramento, CA.

Costa-Isenberg Water Transfer Law of 1986 (California Water Code, Sections 470, 475, 480-483).

DWR, 2003. California's Groundwater Bulletin 118-31. CA Department of Water Resources, Sacramento, CA.

- DWR, 2005. *California Urban Water Management Planning Act*, Article 2, Section 10630(d). CA Department of Water Resources, Sacramento, CA. July 5.
- DWR, 2005. *State Water Project Delivery Reliability Report 2005*. CA Department of Water Resources, Sacramento, CA.
- DWR, 2007. *State Water Project Delivery Reliability Report 2007*. CA Department of Water Resources, Sacramento, CA.
- DWR, 2008. *California State Water Project Bulletin 132*. CA Department of Water Resources, Sacramento, CA.
- DWR, 2009. Final California Water Plan Update 2009. *Integrated Water Management Bulletin 160*. CA Department of Water Resources, Sacramento, CA.
- DWR, 2009. *Public Water System Statistics*. CA Department of Water Resources, Sacramento, CA.
- DWR, 2009. *State Water Project Delivery Reliability Report 2009*. CA Department of Water Resources, Sacramento, CA.
- DWR, 2010. *20x2020 Water Conservation Plan*. CA Department of Water Resources, Sacramento, CA.
- Hardt, W.F., 1971. *Hydrologic Analysis of Mojave River Basin, California, Using Electric Analog Model*. U.S. Geological Survey, U.S. Geological Survey, Menlo Park, CA, August, 1971.
- Izbicki, J. A. 2004. Source and Movement of Ground Water in the Western Part of the Mojave Desert, Southern California, USA. U.S. Geological Survey Water-Resources Investigations Report 03-4313, Prepared in cooperation with Mojave Water Agency. Sacramento, CA.
- Mojave Basin Area Judgment, 1996. *Judgment After Trial, City of Barstow et al. Vs. City of Adelanto et al.* Superior Court Case No. 208568, Riverside County, CA.
- Mojave Basin Area Watermaster, 2010. *Sixteenth Annual Report of the Mojave Basin Area Watermaster for Water Year 2008-2009*. Mojave Basin Area Watermaster, Apple Valley, CA, May 2010.
- MWA, 2000. *Watermaster Consumptive Use Study and Update of Production Safe Yield Calculations for the Mojave Basin Area*. Prepared by Webb Associates.
- MWA, 2004. *2004 Regional Water Management Plan*. Mojave Water Agency, Apple Valley, CA. Prepared by Schlumberger Water Services, Apple Valley, CA.
- MWA, 2011. *2010 Draft Urban Water Management Plan*. Mojave Water Agency, Apple Valley, CA. Prepared by Kennedy/Jenks Consultants. April.

- Office of Administrative Law, 2005. *California Code of Regulations (CCR), Title 22*. CA Office of Administrative Law, Sacramento, CA.
- Smith, G.A. and Pimentel, M.I. (2000) Regional Water Table (1998) and Ground-Water-Level Changes in the Mojave River and the Morongo Ground-Water Basins, San Bernardino County, California. *Water-Resources Investigations Report 00-4090*. U.S. Geological Survey, Sacramento, CA.
- Southern California Association of Governments (SCAG), 2012. *Regional Transportation Plan (RTP)*. Los Angeles, CA
- Stamos, C.L., Martin, P., Nishikawa, T., and Cox, B.F. (2001) *Simulation of Ground-Water Flow in the Mojave River Basin, California*. Water-Resources Investigations Report 01-4002 Version 3, U.S. Geological Survey, Sacramento, CA.
- Stamos, C.L., Nishikawa, T., and Martin, P. (2001b) *Water Supply in the Mojave River Ground-Water Basin, 1931-99, and the Benefits of Artificial Recharge*. Water Fact Sheet 122-01, U.S. Geological Survey, Sacramento, CA.
- Victor Valley Wastewater Reclamation Authority (VWWRA), 2005. *Sewerage Facilities Plan Update 2005 Amendment*. Victorville, CA. August.
- VWWRA, 2009. *VWWRA Flow Projection Update*. Prepared by RBF Consulting. Hesperia, CA. April.





## Appendix A

---

### UWMP Checklist



**Urban Water Management Plan Checklist (Table I-2, Organized by Legislation)**

No.	UWMP Requirement <sup>a</sup>	Additional Clarification	Apple Valley Ranchos Water Company
1	Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.		2.3, 2.4
2	<i>Wholesalers:</i> Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions. <i>Retailers:</i> Conduct at least one public hearing that includes general discussion of the urban retail water supplier's implementation plan for complying with the Water Conservation Bill of 2009.	Retailer and wholesalers have slightly different requirements	1.3.2, Table 1-2, Appendix B
3	Report progress in meeting urban water use targets using the standardized form.	Standardized form not yet available	TBD
4	Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.		1.3.1, 1.3.3, Table 1-1
5	An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.		1.3.4
6	Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.		1.3.3, notification letters in Appendix B.
7	The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).		1.3.2
8	Describe the service area of the supplier		1.4, Figure 1-1
9	(Describe the service area) climate		1.5, Table 1-3
10	(Describe the service area) current and projected population . . . The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier . . .	Provide the most recent population data possible. Use the method described in "Baseline Daily Per Capita Water Use." See Section M.	2.2, Tables 2-1, 2-2
11	. . . (population projections) shall be in five-year increments to 20 years or as far as data is available.	2035 and 2040 can also be provided to support consistency with SB610/221 documents.	Tables 2-1, 2-2
12	Describe . . . other demographic factors affecting the supplier's water management planning		1.7

**Urban Water Management Plan Checklist (Table I-2, Organized by Legislation)**

No.	UWMP Requirement <sup>a</sup>	Additional Clarification	Apple Valley Ranchos Water Company
13	Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).	The 'existing' water sources should be for the same year as the "current population" in line 10. 2035 and 2040 can also be provided to support consistency with SB610/221 documents.	3.1, 3.2, Table 3-1
14	(Is) groundwater . . . identified as an existing or planned source of water available to the supplier . . . ?	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated seawater, brackish groundwater, and other.	3.2.1
15	(Provide a) copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management. Indicate whether a groundwater management plan been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.		Appendix D, 3.2.1.1
16	(Provide a) description of any groundwater basin or basins from which the urban water supplier pumps groundwater.		3.2.1.2
17	For those basins for which a court or the board has adjudicated the rights to pump groundwater, (provide) a copy of the order or decree adopted by the court or the board		Appendix C
18	(Provide) a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.		3.2.1.2.2, Table 3-3
19	For basins that have not been adjudicated, (provide) information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.		NA
20	(Provide a) detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.		3.2.1.2.2, Table 3-4
21	(Provide a) detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.	Provide projections for 2015, 2020, 2025, and 2030.	3.2.1.2.2, Table 3-5
22	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following: (A) An average water year, (B) A single dry water year, (C) Multiple dry water years.		3.2.1.2.2, Table 3-6

**Urban Water Management Plan Checklist (Table I-2, Organized by Legislation)**

No.	UWMP Requirement <sup>a</sup>	Additional Clarification	Apple Valley Ranchos Water Company
23	For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.		3.2.2
24	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.		3.3.1, 3.3.2
25	Quantify, to the extent records are available, past and current water use, and projected water use (over the same five-year increments described in subdivision (a)), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses: (A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof;(I) Agricultural.	Consider "past" to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years.	2.3, 2.5, Table 2-4 to 2-7, Figure 2-2
26	(Describe and provide a schedule of implementation for) each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following: (A) Water survey programs for single-family residential and multifamily residential customers; (B) Residential plumbing retrofit; (C) System water audits, leak detection, and repair; (D) Metering with commodity rates for all new connections and retrofit of existing connections; (E) Large landscape conservation programs and incentives; (F) High-efficiency washing machine rebate programs; (G) Public information programs; (H) School education programs; (I) Conservation programs for commercial, industrial, and institutional accounts; (J) Wholesale agency programs; (K) Conservation pricing; (L) Water conservation coordinator; (M) Water waste prohibition;(N) Residential ultra-low-flush toilet replacement programs.	Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules.	Chapter 6
27	A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.		6.2.3.3
28	An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.		6.2.3.4
29	An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following: (1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors; (2) Include a cost-benefit analysis, identifying total benefits and total costs; (3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost; (4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.	See 10631(g) for additional wording.	6.2.3.2

**Urban Water Management Plan Checklist (Table I-2, Organized by Legislation)**

No.	UWMP Requirement <sup>a</sup>	Additional Clarification	Apple Valley Ranchos Water Company
30	(Describe) all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.		3.2, Table 3-1
31	Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.		3.4
32	Include the annual reports submitted to meet the Section 6.2 requirement (of the MOU), if a member of the CUWCC and signer of the December 10, 2008 MOU.	Signers of the MOU that submit the annual reports are deemed compliant with Items 28 and 29.	NA
33	Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030.	3.2, Table 3-1
34	The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.		2.5.3
35	Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.		7.3
36	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.		7.4, Table 7-2
37	(Identify) actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.		7.5
38	(Identify) additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.		7.6
39	(Specify) consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.		7.7
40	(Indicated) penalties or charges for excessive use, where applicable.		7.8

**Urban Water Management Plan Checklist (Table I-2, Organized by Legislation)**

No.	UWMP Requirement <sup>a</sup>	Additional Clarification	Apple Valley Ranchos Water Company
41	An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.		7.9
42	(Provide) a draft water shortage contingency resolution or ordinance.		7.10, Appendix F
43	(Indicate) a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.		7.11
44	Provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area	4.3.2	3.5
45	(Describe) the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	4.3.2	3.5.1, Table 3-7
46	(Describe) the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.		3.5.1
47	(Describe) the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.		3.5.1
48	(Describe and quantify) the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.		3.5.2, 3.5.3
49	(Describe) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.		3.5.3
50	(Describe the) actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.		3.5.4
51	(Provide a) plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.		3.5.4
52	The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.	For years 2010, 2015, 2020, 2025, and 2030	Chapter 4

**Urban Water Management Plan Checklist (Table I-2, Organized by Legislation)**

No.	UWMP Requirement <sup>a</sup>	Additional Clarification	Apple Valley Ranchos Water Company
53	Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.		5.3, 5.4, Table 5-1 to 5-4
54	The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.		Appendix B
55	Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.		1.3.1, 1.3.3, Table 1-1
56	Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area.		1.3.2, 1.3.3, Table 1-2, Appendix B
57	After the hearing, the plan shall be adopted as prepared or as modified after the hearing.		1.3.2, Table 1-2
58	An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.		1.3.2, Table 1-2
59	An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.		1.3.2
60	Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.		1.3.2

- a) The UWMP Requirement descriptions are general summaries of what is provided in the legislation. Urban water suppliers should review the exact legislative wording prior to submitting its L
- b) The Subject classification is provided for clarification only. It is aligned with the organization presented in Part 1 of this guidebook. A water supplier is free to address the UWMP Requiremer



## Appendix B

---

### Public Outreach Materials



## Review of Draft UWMP Documentation

---

## Sandra Carlson

---

**From:** Jeff Kinnard [jeff@AVRWATER.com]  
**Sent:** Thursday, June 09, 2011 2:09 PM  
**To:** Sandra Carlson  
**Attachments:** Notice of Public Hearing.pdf; public hearing notice2011.docx; AV Ranchos legal 6-3.pdf

Sandra,

Attached is some of the info that you requested. Jeanne Marie from Park Water has spoken to Mary Lou about the requirements for the Adoption Resolution and is working on a draft. I have my own but am awaiting hers to see if there is anything I need to add. I'll get it to you ASAP. The Notice of Public Hearing pdf was posted at the Library, Town Hall, Post Office, and our office. The public hearing notice was sent by mail to six local and state entities. The legal is what appeared in our local paper "The Daily Press". The UWMP will be inserted into our website after completion and adoption.

Thanks,

Jeff Kinnard  
Production Supervisor  
Apple Valley Ranchos Water Company  
Direct: 760-240-8323  
Cell: 760-559-1410

*If you are not the intended recipient of this email you are not to disclose, copy, distribute or use the information or material contained in or attached to this email. Instead, please immediately contact me and destroy the original email and attachments without reading or saving them. Thank you.*

**Notice of Public Hearing for the 2010  
Apple Valley Ranchos Water Company  
Urban Water Management Plan**

Pursuant to Water Code, section 10621 and in order to ensure opportunity for public feedback, input, and suggestions concerning the 2010 UWMP a public hearing will be held 9:30 AM on June 20th at our office located at 21760 Ottawa Road, Apple Valley, CA 92307.

A draft UWMP will be available for review. Please call 760-240-8323 with any questions.

Published in the Daily Press  
June 3, 2011  
(F-147)

**APPLE VALLEY RANCHOS  
WATER CO.**

P.O. BOX 7005  
21760 OTTAWA ROAD  
APPLE VALLEY, CA 92307  
(760) 247-6484 • FAX (760) 247-1654



**Subject: Notification of Public Hearings for the 2010 Apple Valley Ranchos Water Company Urban Water Management Plan**

Notice of Public Hearing for the 2010 Apple Valley Ranchos Water Company Urban Water Management Plan. Pursuant to Water Code, section 10621 and in order to ensure opportunity for public feedback, input, and suggestions concerning the 2010 UWMP a public hearing will be held 9:30 AM on June 20<sup>th</sup> at our office located at 21760 Ottawa Road, Apple Valley, CA 92307. A draft UWMP will be available for review. Please call 760-240-8323 with any questions.

## Public Meeting Notice Documentation

---

**APPLE VALLEY RANCHOS  
WATER CO.**

P.O. BOX 7005  
21760 OTTAWA ROAD  
APPLE VALLEY, CA 92307  
(760) 247-6484 • FAX (760) 247-1654



May 5<sup>th</sup>, 2011

Marlin Lesley  
Superintendent, Golden State Water Company  
13608 Hitt Road  
Apple Valley, CA 92308

**Subject: Notification of Public Hearings for the 2010 Apple Valley Ranchos Water Company  
Urban Water Management Plan**

Dear Mr. Lesley,

Apple Valley Ranchos Water Company (AVRWC) is providing you with this notice pursuant to Water Code, section 10621, subdivision (b) of the act which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan. Additionally, when a draft UWMP is available for public review, a copy will be sent to you.

In order to insure sufficient opportunity for public feedback, input and suggestions concerning the 2010 UWMP, this public hearing is being scheduled. Additional hearings may be scheduled if needed.

The public hearing will be held at 9:30 a.m. on Monday, June 20, 2011. The hearing will take place at the AVRWC office, located at 21760 Ottawa Road, Apple Valley, California 92308.

If you have any questions please contact me at (760) 240-8323.

Sincerely,

Jeff Kinnard  
Production Supervisor  
Apple Valley Ranchos Water Company



**APPLE VALLEY RANCHOS  
WATER CO.**

P.O. BOX 7005  
21760 OTTAWA ROAD  
APPLE VALLEY, CA 92307  
(760) 247-6484 • FAX (760) 247-1654



May 5<sup>th</sup>, 2011

Dennis Cron  
Assistant Town Manager  
Town of Apple Valley  
14955 Dale Evans Parkway  
Apple Valley, CA 92307

**Subject: Notification of Public Hearings for the 2010 Apple Valley Ranchos Water Company  
Urban Water Management Plan**

Dear Mr. Cron,

Apple Valley Ranchos Water Company (AVRWC) is providing you with this notice pursuant to Water Code, section 10621, subdivision (b) of the act which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan. Additionally, when a draft UWMP is available for public review, a copy will be sent to you.

In order to insure sufficient opportunity for public feedback, input and suggestions concerning the 2010 UWMP, this public hearing is being scheduled. Additional hearings may be scheduled if needed.

The public hearing will be held at 9:30 a.m. on Monday, June 20, 2011. The hearing will take place at the AVRWC office, located at 21760 Ottawa Road, Apple Valley, California 92308.

If you have any questions please contact me at (760) 240-8323.

Sincerely,

Jeff Kinnard  
Production Supervisor  
Apple Valley Ranchos Water Company

**APPLE VALLEY RANCHOS  
WATER CO.**

P.O. BOX 7005  
21760 OTTAWA ROAD  
APPLE VALLEY, CA 92307  
(760) 247-6484 • FAX (760) 247-1654



May 5<sup>th</sup>, 2011

Brenda Romero  
Sanitary Engineer  
S.C. Drinking Water Field Operations Branch  
464 West 4<sup>th</sup> Street, Suite 437  
San Bernardino, CA 92401

**Subject: Notification of Public Hearings for the 2010 Apple Valley Ranchos Water Company  
Urban Water Management Plan**

Dear Ms. Romero,

Apple Valley Ranchos Water Company (AVRWC) is providing you with this notice pursuant to Water Code, section 10621, subdivision (b) of the act which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan. Additionally, when a draft UWMP is available for public review, a copy will be sent to you.

In order to insure sufficient opportunity for public feedback, input and suggestions concerning the 2010 UWMP, this public hearing is being scheduled. Additional hearings may be scheduled if needed.

The public hearing will be held at 9:30 a.m. on Monday, June 20, 2011. The hearing will take place at the AVRWC office, located at 21760 Ottawa Road, Apple Valley, California 92308.

If you have any questions please contact me at (760) 240-8323.

Sincerely,

Jeff Kinnard  
Production Supervisor  
Apple Valley Ranchos Water Company

**APPLE VALLEY RANCHOS  
WATER CO.**

P.O. BOX 7005  
21760 OTTAWA ROAD  
APPLE VALLEY, CA 92307  
(760) 247-6484 • FAX (760) 247-1654



May 5<sup>th</sup>, 2011

Tim Gobler  
Water Resources Planning Analyst  
22450 Headquarters Drive  
Apple Valley, CA 92307

**Subject: Notification of Public Hearings for the 2010 Apple Valley Ranchos Water Company  
Urban Water Management Plan**

Dear Mr. Gobler,

Apple Valley Ranchos Water Company (AVRWC) is providing you with this notice pursuant to Water Code, section 10621, subdivision (b) of the act which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan. Additionally, when a draft UWMP is available for public review, a copy will be sent to you.

In order to insure sufficient opportunity for public feedback, input and suggestions concerning the 2010 UWMP, this public hearing is being scheduled. Additional hearings may be scheduled if needed.

The public hearing will be held at 9:30 a.m. on Monday, June 20, 2011. The hearing will take place at the AVRWC office, located at 21760 Ottawa Road, Apple Valley, California 92308.

If you have any questions please contact me at (760) 240-8323.

Sincerely,

Jeff Kinnard  
Production Supervisor  
Apple Valley Ranchos Water Company

**APPLE VALLEY RANCHOS  
WATER CO.**

P.O. BOX 7005  
21760 OTTAWA ROAD  
APPLE VALLEY, CA 92307  
(760) 247-6484 • FAX (760) 247-1654



May 5<sup>th</sup>, 2011

Dana Armstrong  
City of Victorville  
14343 Civic Drive P.O. Box 5001  
Victorville, CA 92392

**Subject: Notification of Public Hearings for the 2010 Apple Valley Ranchos Water Company  
Urban Water Management Plan**

Dear Ms. Armstrong,

Apple Valley Ranchos Water Company (AVRWC) is providing you with this notice pursuant to Water Code, section 10621, subdivision (b) of the act which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan. Additionally, when a draft UWMP is available for public review, a copy will be sent to you.

In order to insure sufficient opportunity for public feedback, input and suggestions concerning the 2010 UWMP, this public hearing is being scheduled. Additional hearings may be scheduled if needed.

The public hearing will be held at 9:30 a.m. on Monday, June 20, 2011. The hearing will take place at the AVRWC office, located at 21760 Ottawa Road, Apple Valley, California 92308.

If you have any questions please contact me at (760) 240-8323.

Sincerely,

Jeff Kinnard  
Production Supervisor  
Apple Valley Ranchos Water Company

**APPLE VALLEY RANCHOS  
WATER CO.**

P.O. BOX 7005  
21760 OTTAWA ROAD  
APPLE VALLEY, CA 92307  
(760) 247-6484 • FAX (760) 247-1654



May 5<sup>th</sup>, 2011

Joy Chakma  
County of San Bernardino  
385 North Arrowhead Ave.  
San Bernardino, CA 92415-0160

**Subject: Notification of Public Hearings for the 2010 Apple Valley Ranchos Water Company  
Urban Water Management Plan**

Dear Mr. Chakma,

Apple Valley Ranchos Water Company (AVRWC) is providing you with this notice pursuant to Water Code, section 10621, subdivision (b) of the act which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan. Additionally, when a draft UWMP is available for public review, a copy will be sent to you.

In order to insure sufficient opportunity for public feedback, input and suggestions concerning the 2010 UWMP, this public hearing is being scheduled. Additional hearings may be scheduled if needed.

The public hearing will be held at 9:30 a.m. on Monday, June 20, 2011. The hearing will take place at the AVRWC office, located at 21760 Ottawa Road, Apple Valley, California 92308.

If you have any questions please contact me at (760) 240-8323.

Sincerely,

Jeff Kinnard  
Production Supervisor  
Apple Valley Ranchos Water Company

**APPLE VALLEY RANCHOS  
WATER CO.**

P.O. BOX 7005  
21760 OTTAWA ROAD  
APPLE VALLEY, CA 92307  
(760) 247-6484 • FAX (760) 247-1654



**Subject: Notification of Public Hearing for the 2010 Apple Valley Ranchos Water Company Urban Water Management Plan**

Notice of public Hearing for the 2010 Apple Valley Ranchos Water Company Urban Water Management Plan. Pursuant to Water Code, section 10621 and in order to ensure opportunity for public feedback, input and suggestions concerning the 2010 UWMP a public hearing will be held 9:30 AM on June 20<sup>th</sup> at our office located at 21760 Ottawa Road, Apple Valley, CA 92307.

A draft UWMP is available for review. Please call 760-240-8323 with any questions.

Please ask cashier for copy to review.

## Appendix C

---

Judgment After Trial January 10, 1996, Mojave Basin Area Adjudication  
Text *(included on CD-ROM)*





## Appendix D

---

MWA 2004 Groundwater Management Plan (*included on CD-ROM*)

*MWA 2004 Regional Water Management Plan - Integrated Regional Water  
Management Plan, Groundwater Management Plan, Urban Water  
Management Plan, Adopted February 24, 2005*



## Appendix E

---

### Town of Apple Valley Water Conservation Ordinance



**Chapter 6.40: WATER CONSERVATION PLAN****Sections:**

- **6.40.010 Findings**
  - **6.40.020 Purpose**
  - **6.40.030 Water Regulations**
  - **6.40.040 Exceptions**
  - **6.40.050 Notice and Penalties**
- 

**6.40.010 Findings**

The Town Council finds that by reason of an apparent overdraft of the water table and because of the current problem existing with respect to the over use of the waste of water in connection with the irrigation of landscape and other outdoor vegetation, lawns and other growth, it is necessary to adopt and enforce a water conservation plan to conserve the water supplies of the Town for the greatest public benefit with particular regard to domestic use, sanitation, and fire protection; and it is the intent of the Town Council to achieve at least an approximately 10% reduction in water use.

**6.40.020 Purpose**

The Town finds that certain water uses regulated or prohibited in this ordinance are non-essential and if allowed would constitute wastage of water.

**6.40.030 Water Regulations**

**A.** No water user within the Town of Apple Valley shall knowingly make, cause, use, or permit the use of water for residential, commercial, industrial, agricultural or any other purpose in the manner contrary to any provision of this Chapter.

**B.** All water users in the Town of Apple Valley shall abide by the following water conservation measures.

1. The use of water for any purpose shall not result in flooding or runoff in gutters, driveways, streets or adjacent lands.
2. Lawns, trees, shrubs, and other landscaping shall not be watered beyond what they need for growth and to sustain life, and water shall not be permitted to pool or to run off property onto streets or adjacent land.
3. Sidewalks, walkways, driveways, parking areas, patios, porches or verandahs or any other like area shall not be washed off with water from hoses or by any other means. The exception to this shall be the washing of flammable or other similar dangerous substances that require direct hose flushing using recognized safety control measures for the benefit of the public health and safety. Notification to the Town of such wash down is required.
4. Water, sprinkling, aerial watering or irrigating of any landscaped or vegetated areas, including lawns, trees, shrubs, grass, ground cover, plants, vines, gardens, vegetables, flowers, or other landscaping shall not occur between the hours of 9:00 a.m. and 6:00 p.m. during the months of April through September provided, however, that these restrictions shall not apply to hand-held hose or drip irrigation systems or to establishment of new lawns, landscaping, or gardens.
5. Non-commercial washing of privately owned vehicles, trailers, motor homes, buses, boats and mobile homes is prohibited except from a bucket, and except that a hose equipped with an automatic shut-off nozzle may be used for a quick rinse.

6. Water shall not be used to clean, fill, operate or maintain levels in decorative fountains unless such water is for replenishment of a recycling system.
7. Water lines, faucets, and other facilities shall be maintained so that they do not leak water. Existing leaks shall be repaired in a timely manner.
8. Restaurants, other food establishments, or other public places where food is served, shall not routinely provide glasses of drinking water to customers unless specifically requested by the customer.
9. Water for construction purposes including, but not limited to, debrushing of vacant land, compaction of fills and pads, trench backfill and other construction uses, shall be used in an efficient manner. The use of aerial type sprinklers is not recommended but, if used, shall not be operated between the hours of 9:00 a.m. and 6:00 p.m..
10. All new residential, commercial and industrial construction shall be equipped with low-flush toilets and low-flow showers and faucets.
11. Water used for cooling systems must be recycled to the extent possible.
12. Evaporation resistant covers are required for all new swimming pools and hot tubs and are encouraged to be installed for existing pools. The covers required by this ordinance shall, at the time of purchase, installation and all subsequent maintenance, meet or exceed current standards and specifications for swimming pool, spa and hot tub covers adopted by the American Society for Testing and Materials (ASTM).
13. Hotels/motels are required to post a notice in substantially the form provided by the Town of Apple Valley urging guests to conserve water.
14. All current and future water customers are encouraged to install flow restrictors or pressure reducers and to install toilet tank displacement devices (dams, bottles or bags), and as appliances or fixtures wear out, replace them with water-saving models.
15. Parks, schools, golf courses, cemeteries, school grounds and all public use lands shall not irrigate between the hours of 9:00 a.m. and 6:00 p.m. during the months of April through September inclusive and are encouraged to use water conservation irrigation equipment.
16. The use of drought tolerant or native plant material is encouraged for exterior landscaping in all new residential, and required for new commercial and industrial construction.
17. The use of low precipitation sprinkler heads, bubblers, drip irrigation and timing devices are required in the exterior landscaping in all new residential, commercial and industrial construction.
18. At least 50% of all new model homes shall include as a part of the exterior landscape development low water use, drought-tolerant or native plants.
19. Projects, including Commercial and Planned Unit Developments, which utilize recycled water from sewage treatment or agricultural operations, may receive an exemption from paragraphs (15) through (18) of this Section by approval of the Town Council.

#### **6.40.040 Exception**

The prohibited or restricted uses of water under this Chapter shall not be applicable in those instances when the Town Manager or his designee finds:

1. The use is essential to avoid an undue hardship for a water user;
2. Special circumstances exist for a particular water user, as distinguished from other water users, which justify allowing an exception;
3. The use is essential for required government or public utility services, including but not limited to police protection, fire protection, sanitation, and other critical or emergency services; or
4. The use is essential to maintain the public health and safety.

(Amended - Ord. #58, 7-24-90)

#### **6.40.050 Penalties**

Any person who violates any provision or who fails to comply with any of the requirement of this Chapter shall be guilty of an infraction and, upon conviction thereof, shall be punished in accordance with the provisions of Sections 1.01.200 through 1.01.230 of Chapter 1.01 of Title 1 of this Code. (Amended Ord. 156, adopted 11-14-95)





## Appendix F

---

### Rule No. 14.1 Water Conservation and Rationing Plan



RULE NO. 14.1

WATER CONSERVATION AND RATIONING PLAN

GENERAL INFORMATION

If water supplies are projected to be insufficient to meet normal customer demand, and are beyond the control of the utility, the utility may elect to implement voluntary conservation using the portion of this plan set forth in Section A of this Rule after notifying the Commission's Water Division of its intent. If, in the opinion of the utility, more stringent water measures are required, the utility shall request Commission authorization to implement the mandatory conservation and rationing measures set forth in Section B. (N)

The Commission shall authorize mandatory conservation and rationing by approving Schedule No. 14.1, Mandatory Water Conservation and Rationing. When Schedule No. 14.1 has expired, or is not in effect, mandatory conservation and rationing measures will not be in force. Schedule No. 14.1 will set forth water use violation fines, charges for removal of flow restrictors, and the period during which mandatory conservation and rationing measures will be in effect.

When Schedule No. 14.1 is in effect and the utility determines that water supplies are again sufficient to meet normal demands, and mandatory conservation and rationing measures are no longer necessary, the utility shall seek Commission approval to rescind Schedule No. 14.1 to discontinue rationing.

In the event of a water supply shortage requiring a voluntary or mandatory program, the utility shall make available to its customers water conservation kits as required by Rule 20. The utility shall notify all customers of the availability of conservation kits.

A. CONSERVATION - NON-ESSENTIAL OR UNAUTHORIZED WATER USE

No customer shall use utility-supplied water for non-essential or unauthorized uses as defined below:

1. Use of water through any connection when the utility has notified the customer in writing to repair a broken or defective plumbing, sprinkler, watering or irrigation system and the customer has failed to make such repairs within 5 days after receipt of such notice.
2. Use of water which results in flooding or run-off in gutters, waterways, patios, driveway, or streets.
3. Use of water for washing aircraft, cars, buses, boats, trailers or other vehicles without a positive shut-off nozzle on the outlet end of the hose. Exceptions include washing vehicles at commercial or fleet vehicle washing facilities operated at fixed locations where equipment using water is properly maintained to avoid wasteful use. (N)

(continued)

(To be inserted by utility)

Issued By

(To be inserted by Cal. P.U.C.)

Advice No. 146-W LEIGH K. JORDAN  
Name

Date Filed SEP 18 2008

Dec. No. EXECUTIVE VICE PRESIDENT  
Title

Effective OCT 17 2008

Resolution No.

RULE NO. 14.1  
(continued)  
WATER CONSERVATION AND RATIONING PLAN

4. Use of water through a hose for washing buildings, structures, sidewalks, walkways, driveways, patios, parking lots, tennis courts, or other hard-surfaced areas in a manner which results in excessive run-off or waste. (N)
5. Use of water for watering streets with trucks, except for initial wash-down for construction purposes (if street sweeping is not feasible), or to protect the health and safety of the public.
6. Use of water for construction purposes, such as consolidation of backfill, dust control, or other uses unless no other source of water or other method can be used.
7. Use of water for more than minimal landscaping in connection with any new construction.
8. Use of water for outside plants, lawn, landscape, and turf areas more often than every other day, with even numbered addresses watering on even numbered days of the month and odd numbered addresses watering on the odd numbered days of the month, except that this provision shall not apply to commercial nurseries, golf courses, and other water-dependent industries.
9. Use of water for watering outside plants, lawn, landscape and turf areas during certain hours if and when specified in Schedule No. 14.1 when the schedule is in effect.
10. Use of water for watering outside plants and turf areas using a hand-held hose without a positive shut-off valve.
11. Use of water for decorative fountains or the filling or topping off of decorative lakes or ponds. Exceptions are made for those decorative fountains, lakes, or ponds which utilize recycled water.
12. Use of water for the filling or refilling of swimming pools.
13. Service of water by any restaurant except upon the request of the patron.

**B. RATIONING OF WATER USAGE**

In the event the conservation measures required by Section A are insufficient to control the water shortage, the utility shall, upon Commission approval, impose mandatory conservation and rationing. Rationing shall be in accordance with the conditions set forth in Schedule No. 14.1 as filed at the time such rationing is approved by the Commission.

Before mandatory conservation and rationing is authorized by the Commission, the utility shall hold public meetings and take all other applicable steps required by Sections 350 through 358 of the California Water Code. (N)

(continued)

RULE NO. 14.1

(continued)

WATER CONSERVATION AND RATIONING PLAN

C. ENFORCEMENT OF MANDATORY CONSERVATION AND RATIONING

1. The water use restrictions of the conservation program, in Section A of this rule, become mandatory when the rationing program goes into effect. In the event a customer is observed to be using water for any nonessential or unauthorized use as defined in Section A of this rule, the utility may charge a water use violation fine in accordance with Schedule No. 14.1. (N)
2. The utility may, after one verbal and one written warning, install a flow-restricting device on the service line of any customer observed by utility personnel to be using water for any non-essential or unauthorized use as defined in Section A above.
3. A flow restrictor shall not restrict water delivery by greater than 50% of normal flow and shall provide the premise with a minimum of 6 Ccf/month. The restricting device may be removed only by the utility, only after a three-day period has elapsed, and only upon payment of the appropriate removal charge as set forth in Schedule No. 14.1.
4. After the removal of the restricting device, if any non-essential or unauthorized use of water shall continue, the utility may install another flow-restricting device. This device shall remain in place until water supply conditions warrant its removal and until the appropriate charge for removal has been paid to the utility.
5. If, despite installation of such flow-restricting device pursuant to the provisions of the previous enforcement conditions, any such non-essential or unauthorized use of water shall continue, then the utility may discontinue water service to such customer. In such latter event, a charge as provided in Rule No. 11 shall be paid to the utility as a condition to restoration of service.
6. Any monies collected by the utility through water use violation fines shall not be accounted for as income, but shall be accumulated by the utility in a separate account for disposition as directed or authorized from time to time by the Commission.
7. The charge for removal of a flow-restricting device shall be in accordance with Schedule No. 14.1.

D. APPEAL PROCEDURE

Any customer who seeks a variance from any of the provisions of this water conservation and rationing plan shall notify the utility in writing, explaining in detail the reason for such a variation. The utility shall respond to each such request.

Any customer not satisfied with the utility's response may file an appeal with the staff of the Commission. The customer and the utility will be notified of the disposition of such appeal by letter from the Executive Director of the Commission. (N)

(continued)

(To be inserted by utility)  
Advice No. 146-W

Issued By  
LEIGH K. JORDAN

(To be inserted by Cal. P.U.C.)  
Date Filed SEP 18 2008

Name

Effective OCT 17 2008

Dec. No.

EXECUTIVE VICE PRESIDENT

Title

Resolution No.

APPLE VALLEY RANCHOS WATER CO.  
21760 OTTAWA ROAD  
P. O. BOX 7005  
APPLE VALLEY, CALIFORNIA 92307-7005

ORIGINAL Cal. P.U.C. Sheet No. 596-W  
Canceling Cal. P.U.C. Sheet No.

RULE NO. 14.1  
(continued)  
WATER CONSERVATION AND RATIONING PLAN

If the customer disagrees with such disposition, the customer shall have the right to file a formal complaint with the Commission. Except as set forth in this Section, no person shall have any right or claim in law or in equity, against the utility because of, or as a result of, any matter or thing done or threatened to be done pursuant to the provisions of this water conservation and rationing plan. (N)

E. PUBLICITY

In the event the utility finds it necessary to implement this plan, it shall notify customers and hold public hearings concerning the water supply situation, in accordance with Chapter 3, Water Shortage Emergencies, Sections 350 to 358, of the California Water Code. The utility shall also provide each customer with a copy of this plan by means of billing insert or special mailings; notification shall take place prior to imposing any fines associated with this plan. In addition, the utility shall provide customers with periodic updates regarding its water supply status and the results of customers' conservation efforts. Updates may be by bill inserts, special mailing, posting, flyer, newspaper, television, or radio spot/advertisement, community bulletin board, or other appropriate methods. (N)

(To be inserted by utility)	Issued By	(To be inserted by Cal. P.U.C.)
Advice No. 146-W	LEIGH K. JORDAN	Date Filed SEP 18 2008
	Name	
Dec. No.	EXECUTIVE VICE PRESIDENT	Effective OCT 17 2008
	Title	Resolution No.